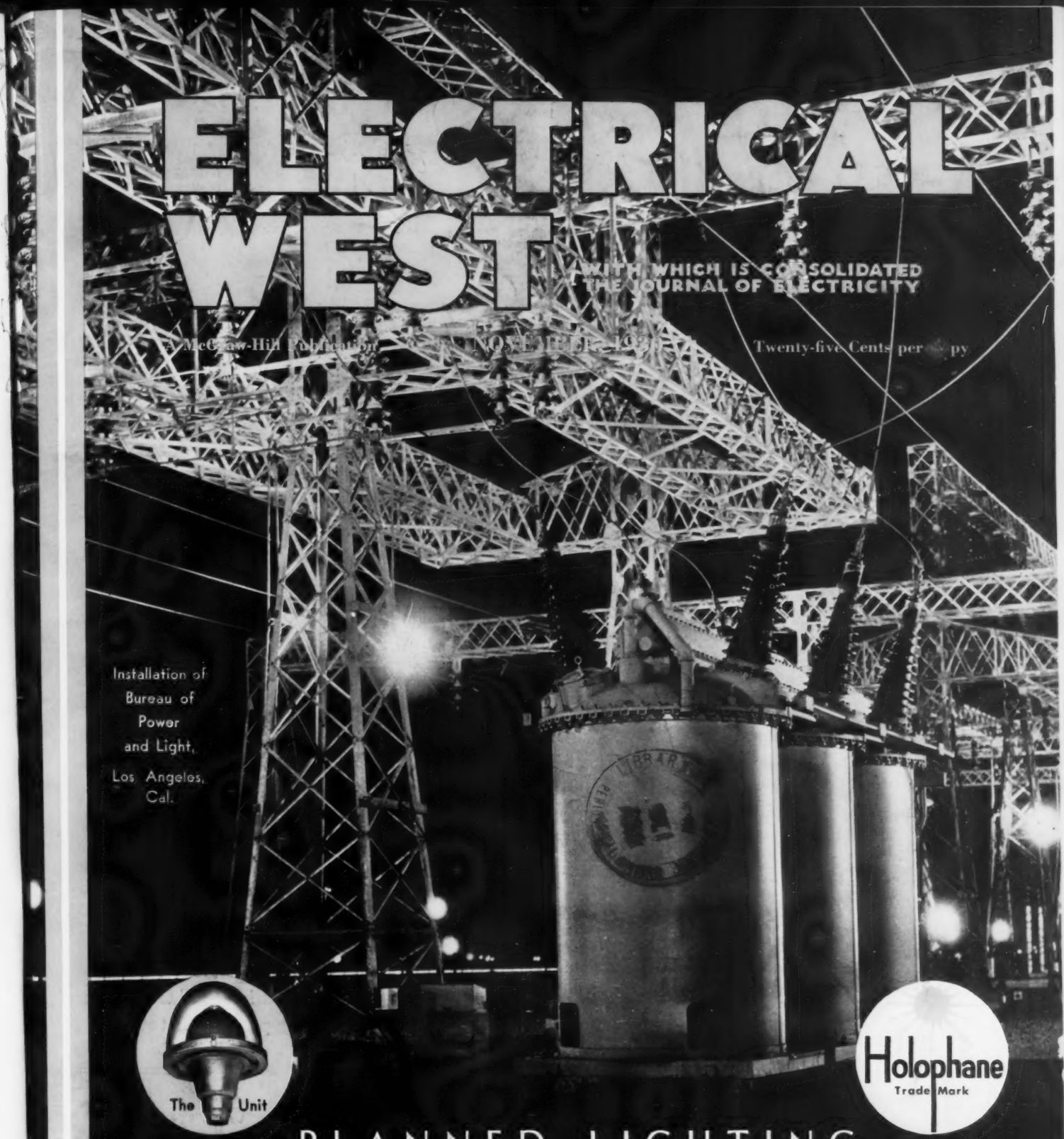
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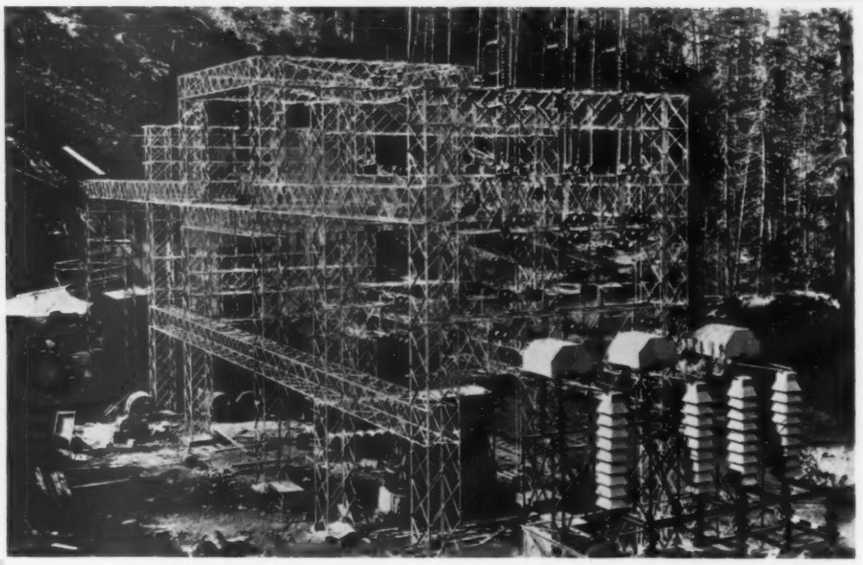

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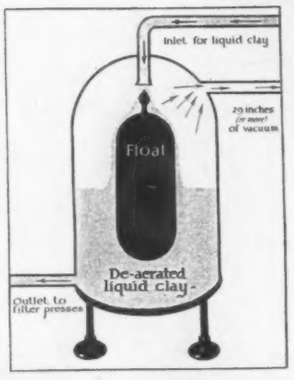

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G. C. TENNEY, *Editor*

ELECTION eve found voters of the West called upon to decide intelligently proper action respecting so many measures that if many fail to grasp the true significance of several public ownership bills or candidates promoting them, it is not to be wondered at. In both Oregon and Washington voluble campaigns on state power measures precede the election. In California several local issues are imminent. It is to be hoped that the good sense and natural conservatism of the public will act to checkmate this business destroying legislation. (See page 261.)

▼ ▼ ▼

ARIZONA has filed its suit but Secretary Wilbur states that work on Boulder Dam will go on just the same. The Southern Sierras Power Company has been awarded the contract to build a line to serve the construction works with power. Such was the status of this all absorbing project as the month closed. So far neither the flow of words nor of water seems likely soon to be dammed. (See page 260.)

▼ ▼ ▼

LIGHTNING, in a country which admits of nothing but "climate," nevertheless must be guarded against. One company's practice points to reduction of system capacity cost per kilowatt without sacrificing essential protection. (See page 230.)

▼ ▼ ▼

RATES arrived at by amicable conference rather than by tedious and antagonistic hearing may make less interesting newspaper reading, but such rates find acceptance with the public, which is chiefly interested in what it is going to get for its dollar. The far-sighted utility is one which of its own volition seeks such rate readjustments as are necessary by this logical and constructive method. (See page 228.)

The Month

DEALER'S part in the merchandising picture was on every tongue at the commercial conclave of the P.C.E.A. Never was so inclusive a program discussed, for under the hover of the electrical industry brooder all merchants who sell electrical appliances of any kind are now invited to shelter. If sales programs lose something of definiteness and predictability of results from the more brotherly attitude which now prevails, there should be a gain of something in friendships which will help the industry through the next few trying years of radical experimentation induced by economic depression.

▼ ▼ ▼

SWITCHES meant to operate capricious and dangerous 440-volt motor circuits must undergo changes in design to meet the requirements of the new tests to which they are subjected by Underwriters' Laboratories. Accident commissions in some localities have ruled that for inductive loads horsepower rated switches must be used, and the inspectors of the Southwest have set Jan. 1 as the date of enforcement. (See pages 252 and 271.)

▼ ▼ ▼

CHRISTMAS outdoor lighting promises this year to exceed even the brilliance and universal decoration of last year, which in itself established lighting records. The entire West is organizing and planning elaborate and colorful programs. In them lighting and radio take first position of importance. The dealers in electrical appliances are setting themselves in readiness to follow the little strings of colored lamps into the homes and make it an all-electrical holiday season. (See page 238.)

Editorial

Merchandising Policies Adjust to New Conditions

SEVERAL new factors brought into play on merchandising policies recently have altered the face of central station practice. Because economic forces are at work still more changes may be expected.

Of first importance was a decision recently handed down by the Wisconsin Railroad Commission in which it was decided that all merchandising costs are to be chargeable to merchandising activities. Profits or losses from merchandising, the decision holds, shall not enter into any rate which shall be charged for utility service. Since this places merchandising strictly on its own feet, it should eliminate one of the many points of contention and therefore be a welcome decision to the electrical industry.

Equally significant is an experiment in merchandise distribution which the Southern California Edison Company is conducting in its Long Beach territory in collaboration with the electrical merchants of that community. As a city of importance, admirably situated to become an ideal test case, Long Beach has among its electrical merchants some of the strongest department store and household furnishings organizations in the Southwest. The very fact that these concerns are taking seriously the electric range is news of first importance. That they are working together and in co-operation with the utility company on a definite range campaign with quota objectives and ample advertising effort is news of no less consequence. From such a field laboratory test the industry's knowledge of mechandise distribution should be greatly enriched. But more important perhaps is the sign that these great merchant organizations are becoming conscious of electrification of the home.

From all parts of the West come indications that the parallel interests of dealer and utility are becoming better understood. Out of this mutual recognition may yet come a better sharing of the burden of electrifying homes and industries. At least the very evident desire on the part of leaders of both groups promises action. Without the desire to find a better method no period of trial or test can promise permanent success.

It is no time for smugness or self-satisfaction, however. The time demands persistent and sincere effort. The economic trends demand a unity of purpose and objective as never before. Progress can be reported, but results in co-operative accomplishment, well worth trying for, still lie ahead.

Three Phases of Inspection

DURING the past two months two groups of electrical inspectors have convened, recorded their year's work of revision and modernization of wiring installation rules, and adjourned to meet again with more experience and knowledge next year for similar work.

Inspection in the past meant but one thing—police duty over the electrician who installed wiring. Its objective was protection of property and life from electrical hazards caused by careless or shoddy workmanship.

When the limitations of inspection were realized there came into the scene re-inspection. The greatest dangers arose, experience proved, not in the original wiring; it was what was added to the original system that overloaded it and created hazards. The careless use of equipment, the improper installation of it, the unauthorized and uninspected wiring job made for greater danger. Now re-inspection has become an important function of many cities. From it the electrical inspectors have developed a new importance. They have need to be diplomats and salesmen as well as police officers.

Now another phase of inspection enters. It is pre-inspection. If a wiring plan can be examined before work starts many costly mistakes can be avoided. Better installation results. Moreover, that most priceless quality—foresight—enters upon the scene. An inspector's experience makes him especially valuable as an adviser to the owner. He can suggest features which will include efficiency or adequacy beyond the mere minimum of the code. He can assist the customer first and the industry afterward in pointing out what growth will do to the contemplated wiring installation to make it a menace rather than a help to efficiency.

It is to this new place that the modern inspector rises—that of almost unbiased consulting engineer. Although all former aspects of his work may have been negative or restrictive, this becomes constructive, creative. Real, economic significance attaches itself to his service for the community. In the electrical industry he becomes a forerunner of better and more complete electrification.

Looks Like a Job for Experts

APPOINTED by Portland's mayor, a committee of city officials has been touring the Northwest looking at various power sites on the Columbia and other rivers preparatory to recommending or not recommending that the city include in its 1931 tax budget the sum of $25,000 with which to carry on an investigation as to the feasibility of Portland's developing its own municipal power system. At the committee's request, officials of the Northwestern Electric Company took the members to the site of the Ariel Dam on the Lewis River.

The visitors were conducted down into the "glory hole" being excavated 110 ft. under the old stream bed to a point 60 ft. below sea level. Here they stood watching the last shovelfuls being loaded into tractor-tread trucks while hundreds of horsepower in pumps carried off some seven or eight thousand gallons of seepage water per minute.

The committeemen were told that studies on the Lewis River had been begun ten years ago. They were told how hundreds of core drillings had been made before the company knew it had a dam site and how hundreds more were taken to chart the exact location of the bedrock in the box canyon. It was a little disconcerting to them to learn that the cost of the preliminary investigations on the Lewis River had amounted to almost ten times what the committee was considering for the city's investigation. Particularly disconcerting, however, was the innocent remark of a newspaper reporter present, who, after seeing the work in progress and hearing the explanation of what it was all about, turned to the committee and said, "It looks to me like a job for experts."

Beating the Bugaboo of Chain-Store Competition

WHEN a chain store opened recently on a corner directly opposite the establishment of a Western contractor-dealer in a city of 25,000 population, that individual was ready to sell out his business for 10 cents on the dollar. Here was the calamity he had read and heard about —that ominous "chain-store competition" that would put any local business in the hands of a receiver in a few months. Fortunately for this particular dealer, he had no offers for his business.

What happened? For the first two months sales went along at the approximate rate they had followed in the past. Then there was a slight increase, followed next month by another increase. The dealer sought for the explanation. Here is what he found. The chain store had an electrical department stocked as completely as the dealer's, but it did not have his training or experience. A technical question put by a customer to the chain store clerk frequently brought this reply: "I don't know, but perhaps the man across the street can tell you; he specializes in electrical things."

Quickly this dealer saw the advantages he had that the chain store did not possess—training, experience, expert knowledge, a capable personnel, and service. He was even quicker to capitalize on these features. Result—an even greater increase in business.

What this contractor-dealer discovered points the way for others faced with similar chain-store competition. Rather than sit back and wait inevitably for the sheriff, the electrical dealer can make capital of those things that no chain store possesses—the advantages that his years of experience have brought him.

Electricity to Control the Gas

IF ELECTRICAL men have been wont to "view the situation with alarm" as natural gas has been piped into territory hitherto served by manufactured gas or solely by electricity, there is something reassuring in the fact that it takes electricity to master and control gas properly. Therefore, even though the natural gas advent has threatened sales of power, electrical merchandise and electrical installations, the situation is not without some glimmer of hope.

Pacific Gas and Electric Company, for example, up to Sept. 1, had sold 6,200 conversion gas burners for old-style hard-fuel furnaces, at an average price of $110. These converters are thermostatically controlled through electrically operated valves. Included in the apparatus are bell-ringing transformers and often time switches.

For installing this equipment an electrical contractor receives $8 minimum, and $13 if a time switch is included. Electrical materials from wholesalers have totaled $159,000. The current consumption is negligible. Yet, in all, the electrical industry has benefited by more than $215,000 in labor and supplies from the sales of this one company alone. Moreover, its bogey is 10,000 such installations for this year.

The moral is that nothing is ever as bad as it looks.

The Industry

Who Should Be the Rate Maker?

Regulation Was Viewed Askance at Its Inception, but Now Many Utilities Take the Initiative to Readjust Rates by Conference Rather Than Wait for "Investigations"

By W. C. McWHINNEY
Commercial Manager, Southern California Edison Company, Ltd.

WITHOUT attempting to discuss the legal aspects of a reasonable return and the ramifications of this much debated subject, it must be conceded that the "man in the street" will grant that the public utility is entitled to a fair return upon its investment, used and useful, in rendering all forms of electric service. The layman is lost in the maze of arguments, pro and con, dealing with such factors as depreciation, obsolescence, rate of return, fixed charges, rate spread, and cost of service; but it will be found generally that, given the true facts, the average person will arrive at a fair conclusion.

Owing to the fact that the electric light and power business is so fraught with public interest, its regulation by public authority was decreed early in its history. At the inception of regulation there was considerable opposition; many thought the industry would be throttled and naturally opposed the new order of things. Instances of resistance to regulation occurred during its earlier days, but as the various commissions were organized, assumed jurisdiction, and announced their policies by rules, regulations, and decisions, the industry, under wise leadership, willingly co-operated with the regulatory bodies. It was soon found that regulation was destined to become constructive and, thanks to the appointive authority, men of character, integrity, ability, and honesty of purpose were selected, and today we see that regulation is beneficial to both the public and the utility.

Compulsory Rate Legislation

Most commissions have prescribed the range within which earnings may fluctuate and the United States Supreme Court has prescribed tests for the determination of the confiscatory character of rates. When the upper limits are exceeded there is complaint by some member of the public, or the commission may, upon its own motion, institute rate proceedings. Compulsory rate legislation should be viewed with disfavor and can usually be avoided if the utility is willing to reduce its rates voluntarily when its earnings clearly exceed the reasonable needs of its business. It is the wise utility that hews closely to a return that, after a fair and full examination of the facts, has been decreed by the regulatory body to be fair and reasonable.

Earnings and expenses can be forecast with reasonable accuracy, so the results of each year may be closely known. Knowing these conditions it is far better that the utility move of its own accord and suggest to the state commission its desire to adjust its rates to meet the changed conditions. The public utility commissioners are certainly inclined to co-operate in such action and would prefer that the utility suggest the rates and designate the consumer groups who, through increased use, are entitled to reduction. The utility with its rate department has a complete knowledge of its consumer groups; knows those whose use is increasing; has an intimate contact with the rate payers; is familiar with the public relations angle; is aware of the rate forms that are proving unsatisfactory, and hence can more logically suggest needed corrections and adjustments. Thus the rate making policy lies, as it should, with the company.

Rates by Conference

Rate making by conference has many advantages as contrasted with the expense and the many prejudiced attacks that usually attend investigations. Proceedings instituted by public authority are given wide publicity which results in attendance at hearings by demagogues who are not informed on rate matters, who have not the ability properly to present a case, and who are only interested in upsetting the general order of things. It is far better to modify rates by conference with those who are constructive and willing to permit a gradual modification and reduction.

Forms of schedules should be progressive and changed only if they are simplified and will be the means of developing greater use at a time when substantial reductions are made; the less tampering and experimenting the better. The historical structure and form of any company should be maintained as much as possible. With consumers accustomed to and familiar with certain types of rates they are likely to look upon the substitution of new forms with doubt and feel in their own minds that they are being hoodwinked. They much prefer to see blocks in existing rates reduced; then they will be convinced.

Too many times have new rates been adopted where their only result has been to bring about a deluge of complaints and a very undesirable effect upon public relations. While electric rates are susceptible of scientific construction, nevertheless the "man in the street" is not interested in the science of rate making. He does not understand such terms as demand, service or stand-by charge, on or off peak, circuits and power factor. It is only the larger power users, with engineering staffs, who appreciate and understand such terms.

By conferring with the regulatory body and suggesting to it a meeting with representatives of important consumer groups, constructive rate adjustments are possible and such action establishes a policy of co-operation that will meet with the instant approval of all parties. That this method meets with public approval is evidenced by the favorable editorial newspaper comments and the many public compliments of consumers which always follow such action.

Electricity is the one commodity which is lower than pre-war levels and it gives every indication of a continuing downward trend. Notwithstanding this fact, we cannot be content with the record. We must search out every possible avenue to lower the cost to our consumers. The electric companies cannot stand still and depend upon their consumers to increase the use of their product. They must continually seek new consumers, develop and promote new uses along the same scientific

and business-like lines as other businesses. They must be progressive and quick to adopt every improvement in the art of production, transmission, distribution, and selling, in order to attain an earning that will permit of periodic voluntary rate reductions. The size of the reduction is not so important as is the fact that one is made.

The business of supplying electrical service is one in which the unit cost declines with increasing use and growth. It is analogous to those other businesses where mass production enters into the manufacturing costs and permits the making of a superior product that can be profitably marketed in large volume at a small margin of profit. The service of the electrical utilities is one that intimately touches the daily lives of all the people and all the industry of the country. If it is dependable, adequate, abundant, and reasonable in cost there will not be much complaint. Each reduction made will be followed with more liberal use by the consuming public. Thus reductions are a stimulus to development.

One Application

A brief outline of the practical application of cooperative rate making as practiced by the Southern California Edison Company, Ltd., with headquarters at Los Angeles, is apropos. Its management had sufficient faith in the plan to propose it to the California Commission in 1927, with a trial reduction in domestic lighting rates of 14 per cent. At that time the average annual use per domestic consumer was 460 kw.-hr. So successful was the result that two years later another reduction (domestic) of 12 per cent was made with the top lighting block 5 cents per kilowatt-hour. Both reductions represented a voluntary decrease to lighting consumers of 25 per cent, and now the average annual consumption per consumer is 645 kw.-hr. During this period there were other schedules, such as industrial power, agricultural power, railway power, street and municipal lighting, general heating and cooking, to which the same principle was applied. In all there were nine separate rate reductions affecting 440,000 consumers. These were brought about by conferences with the state regulatory body and, in many cases, representatives of important consumer groups were present. Some of the changes were the result of suggestions from consumers who, from time to time, submitted their thoughts as to rate forms. During the past seven years there has not been a single formal rate complaint filed against this company. So satisfactorily has this plan functioned that the company fully believes in passing along voluntarily to consumers, as financial conditions justify, the economies developed from operations and the growth due to intensive load building.

Load Building Needed

Preliminary to any plan of voluntary rate adjustments is a constructive and aggressive load-building program. Promoting all manner of new business and selling every current consuming appliance is the advance agent which makes rate reductions possible, and before final reductions the new business department should be thoroughly organized and functioning so that it can capitalize properly the new and lower schedules. Lower rates are accepted by the consumer by a greater use of electric energy, and so the cycle of increased consumption followed by declining rates is started. It is only by intensive load building and economical operation that any such rate program can be maintained.

On July 1, 1927, the first voluntary reduction was made, but a full year before that time the new business and merchandise departments were geared to an augmented program of increasing consumption and earnings. When these departments became fully organized and the results of their work began to reflect in consumer use, the first reduction was proposed. The company's prediction was fully confirmed by subsequent results and again on Nov. 1, 1929, the second reduction was ordered.

With such a rate program the public utility is certain to have good public relations, will realize a better than average growth, and will have little to fear from rate legislation.

▼

Department Organizes Into Club

SIMPLY to promote good fellowship and to encourage better acquaintance among the members of the record department of the San Diego Consolidated Gas & Electric Company, a "Dutch Treat Club" was formed nearly a year ago at the instigation of R. C. Cavell, superintendent of the department, and has been flourishing since. Its membership consists exclusively of members of the record department.

To accomplish the ends for which it was formed, meetings are held once a week, at lunch hour. The members,

One session of the "Dutch Treat" Club

both men and women, bring their own lunches, drink coffee made and served by volunteers, talk, draw lots to see who washes cups and spoons, and then give attention for half an hour while being entertained. Each week a different member (also determined by lot) is charged with the duty of providing the program, which usually takes the form of a talk by some prominent authority on some topic in which everyone is interested. Occasionally, the time is taken up entirely by music. In any case, the program never costs a cent, and no one talks shop.

Lack of dues, applications, officers, constitution, rules, fines, and formality makes a flexible organization and enables a 100 per cent enrollment from the personnel of the department.

Another activity of the club is the annual picnic.

While the objects of the club may seem trivial and useless as revenue producers, they are highly profitable in building departmental spirit and loyalty, in developing the individual personality, and in bringing new knowledge to its members. Many members of the department have been helped in overcoming timidness and reticence; each has been enabled to cultivate his individuality.

Engineering

Lightning Arrester Practice in Southern California

By E. R. STAUFFACHER
Electrical Protection Engineer, Southern California Edison Company, Ltd.

INSTEAD of following the older practice of installing one set of lightning arresters upon each of the lines entering and leaving a substation, the Southern California Edison Company, Ltd., is now following the simplified practice of installing lightning arresters only on transformer banks. The use of pole-top arrester units and the application of arresters to major consumer substations also are indicative of a changed order of affairs.

The plan of reducing arrester installations at substations is in keeping with the company's policy of reducing the cost per kilowatt of system capacity, and is one of the design features and operating practices that have contributed materially to the desired result. Reduction in equipment required and the resulting reduction in

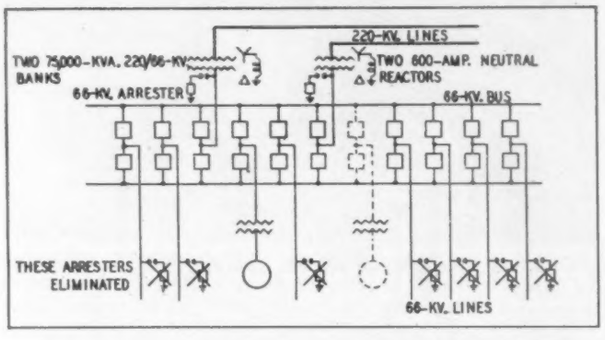


Fig. 1. Schematic diagram of new 150,000-kva., 220/66-kv. La Fresa substation, showing use of one lightning arrester on the low-tension side of each of the two main transformer banks and indicating the simplicity and economy effected by elimination of arresters from the outgoing 66-kv. lines

capital expenditure may be visualized by considering specifically one of the latest substations.

At the company's new 220-kv. La Fresa substation there will be eventually as many as thirty 66-kv. line positions, three 75,000-kva. transformer banks between the 220-kv. and 66-kv. buses, and probably several synchronous condensers. Under the originally established lightning arrester procedure this station would have required thirty separate sets of lightning arresters, one for each line position. Under the new practice only three sets are required, one on each of the three transformer banks.

Particular attention is given to the selection of a rugged and time-tested design of lightning arrester, since entire dependence is being placed upon a reduced number of units.

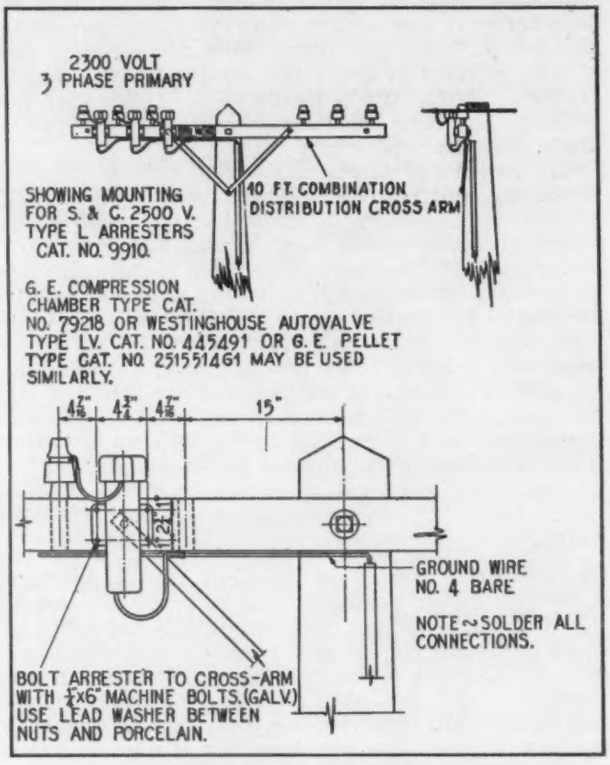

2300 VOLT 3 PHASE PRIMARY
SHOWING MOUNTING FOR S. & C. 2500 V. TYPE L ARRESTERS CAT. NO. 9910.
10 FT. COMBINATION DISTRIBUTION CROSS ARM
G. E. COMPRESSION CHAMBER TYPE CAT. NO. 79218 OR WESTINGHOUSE AUTOVALVE TYPE LV. CAT. NO. 445491 OR G. E. PELLET TYPE CAT. NO. 251551AG1 MAY BE USED SIMILARLY.
15"
GROUND WIRE NO. 4 BARE
NOTE—SOLDER ALL CONNECTIONS.
BOLT ARRESTER TO CROSS-ARM WITH ⅝x6" MACHINE BOLTS. (GALV.) USE LEAD WASHER BETWEEN NUTS AND PORCELAIN.

Fig. 2. Details of pole-top lightning arrester installation for 2.3-kv. distribution service

Elimination of lightning arresters on line positions is one of the major contributing factors in the simplification of design and economical construction of substations. At La Fresa the conventional type of steel bus structure has been done away with completely in favor of the simpler and more economical pedestal type of bus support. Only A-frame structures are required over the line oil circuit breakers to provide mounting space for disconnecting switches and also to provide a line take-off. If lightning arresters had been installed on each of the line positions, the minimum additional equipment required, other than the arresters themselves, would have been an adequate foundation pad, protective screening and fencing, and provision for the mechanical support of leads to and from the arrester units.

POLE-TOP ARRESTERS

A second set-up in the company's modified lightning arrester program is exemplified in the use of the distribution type of lightning arresters mounted on poles adjacent to substations. This applies principally to distribution circuits and to the 11- and 16-kv. "secondary transmission circuits" from the low-tension side of the 66-kv. transformer banks. This scheme obviates the necessity of the rack space otherwise required for the arresters, eliminating the extra foundations and other features. The new practice has been followed for the past year or so with thoroughly satisfactory results.

In the territory somewhat removed from the coast distribution-type arresters are mounted directly on crossarms under the line wires, but for fog areas a special insulator mounting has been developed which increases the creepage or leakage distance to ground.

Pole-top arresters now are used on lines of voltages ranging from 2.3 to 33 kv. Furthermore, in several cases distribution-type arresters have been used on 66-kv. cir-

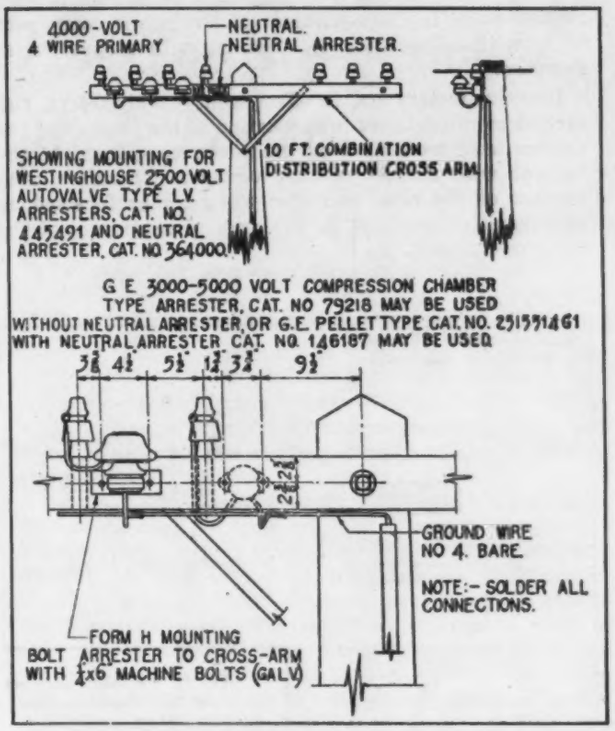

4000-VOLT
4 WIRE PRIMARY
NEUTRAL.
NEUTRAL ARRESTER.
SHOWING MOUNTING FOR WESTINGHOUSE 2500 VOLT AUTOVALVE TYPE L.V. ARRESTERS, CAT. NO. 445491 AND NEUTRAL ARRESTER, CAT. NO 364000.
10 FT. COMBINATION DISTRIBUTION CROSS ARM.
G E 3000-5000 VOLT COMPRESSION CHAMBER TYPE ARRESTER, CAT. NO 79218 MAY BE USED WITHOUT NEUTRAL ARRESTER, OR G.E. PELLET TYPE CAT. NO. 251591461 WITH NEUTRAL ARRESTER CAT. NO. 146187 MAY BE USED
3⅜ 4½ 5½ 1½ 3¼ 9½
2½
GROUND WIRE NO 4. BARE.
NOTE:- SOLDER ALL CONNECTIONS.
FORM H MOUNTING BOLT ARRESTER TO CROSS-ARM WITH ⅜x6 MACHINE BOLTS (GALV)

Fig. 3. Details of installation of lightning arresters on pole tops for 4-kv. service

cuits. At one substation 66-kv. arrester units were mounted outside of the substation building on special crossarm supports provided for that purpose, resulting in a cheaper and simpler job than the standard station-type indoor arrester installation.

Arresters are installed on these circuits to provide protection from atmospheric disturbances, but they also have proved to be of great value upon the occasion of contacts between 66-kv. circuits and the circuits of lower voltages. Often two or three circuits of different voltages are carried on the same pole line and occasions have arisen where troubles have involved two or three circuits at once. In one particular case a short circuit involved directly a 66-kv. line, an 11-kv. line, and a 4-kv. line, and resulted in burning down that 4-kv. line. Line-type arresters happened to be in service on both the 11-kv. and the 4-kv. circuits, and while the operating duty required of them was so severe that some of them were completely destroyed, they served their function and cleared all circuits of the trouble with no equipment damage whatsoever.

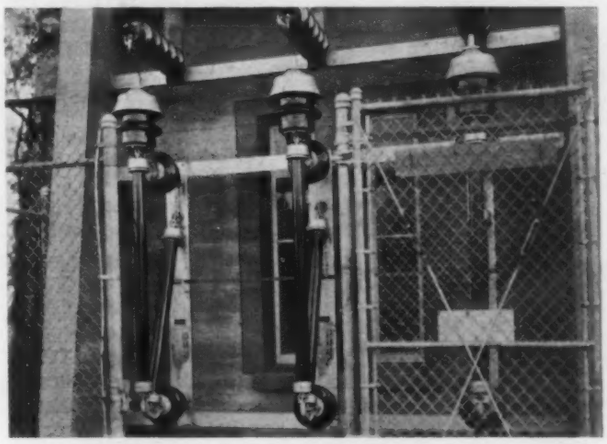


Fig. 4. Line-type lightning arresters used for 66-kv. service at a substation, mounted on a rack outside of the substation building instead of on an adjacent pole top because of their physical size. An economical and effective installation

Arresters on Consumer Substations

A third step in the modification of the company's lightning arrester program is the decision to apply lightning arrester equipment to a number of important consumer substations having an installed transformer capacity of 450 kva. or more. This is something of a pioneering move and present knowledge is not sufficiently complete to permit the exact determination of the minimum size of consumer substations upon which a lightning arrester installation is justified. However, a study of the information available leads to a belief that transformer banks smaller than three 150-kva. units or their equivalent do not warrant lightning arrester protection.

Application of lightning arresters to consumer substations is being made not only to provide protection against lightning disturbances, but just as much to provide protection against possible damage due to destructively high voltage transients. These result from trouble conditions which bring low-voltage consumer circuits into contact with high-tension lines. When applied to this service such arresters have been termed "high-voltage deflectors." Experience has shown that horn gaps alone do not provide adequate protection for such installation unless of special design and unless enclosed in a protective housing that will keep out birds and insects.

As an indication of the extent to which the application of lightning arresters to consumers' substations is contemplated, it may be stated that 23 out of 35 consumer industrial substations in the Long Beach district are to

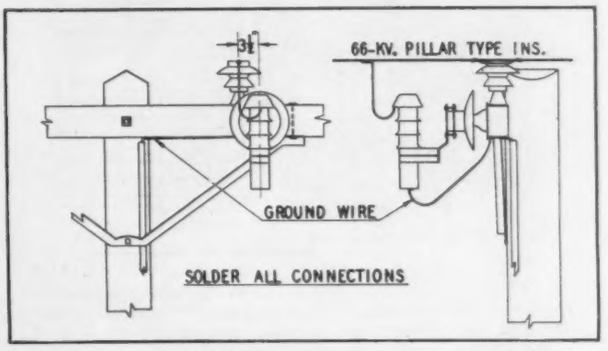


Fig. 5. Detail showing method of mounting line-type lightning arresters on crossarms for 11-16-kv. service

be so equipped during 1930. These substations range in capacity from a minimum of 450 kva. to 3,000 kva. Average complete installation cost for these 23 installations will be about $85 per substation.

From operating records kept over a long period of time it has become apparent that lightning is one of the predominating causes of circuit interruption and distribution transformer damage over the Edison system as a whole. This is true in spite of the fact that severe and sustained lightning storms or regularly recurring lightning storms are practically unknown in California except in the mountain regions. Thus it is that lightning protection for electrical equipment is a live subject in southern California.

Reactive Kva. Metering—III

Cross-Phase Connections Provide Required Phase Relations for Reactive Kva. Metering on Two-Phase Circuit

By E. C. GOODALE
Tacoma, Washington

IN PREVIOUS articles on single-phase reactive metering it was stated that in order to change a wattmeter into a reactive meter it is necessary only to energize the potential element of the wattmeter with a voltage equal to, but lagging 90 deg. behind the voltage which would be used in measuring the kilowatts of the circuit, using the same current as for the kilowatt measurement. This same principle is true likewise for polyphase circuits.

In two-phase circuits all that is necessary is to "cross-phase" for one potential and "cross-phase and reverse" for the other. Fig. 8 shows the connections for metering a two-phase four-wire circuit. Both a wattmeter and a reactive meter are used, the former to determine the kw. power and the latter to find the reactive kva.

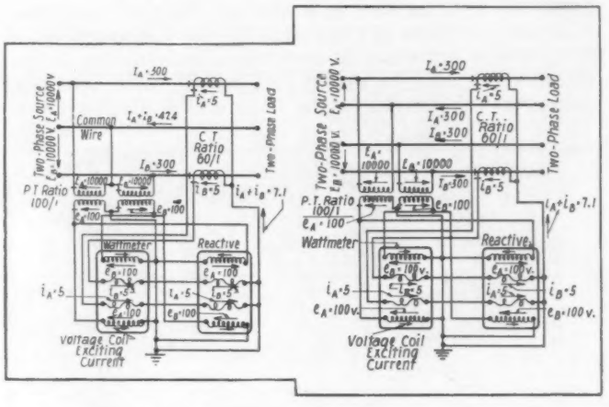


Fig. 8 (right). Connections for reactive metering on a two-phase four-wire circuit. Note that e_A is in reverse direction through the voltage coil of the reactive meter. Fig. 9 (left) shows reactive metering connections for two-phase three-wire circuit

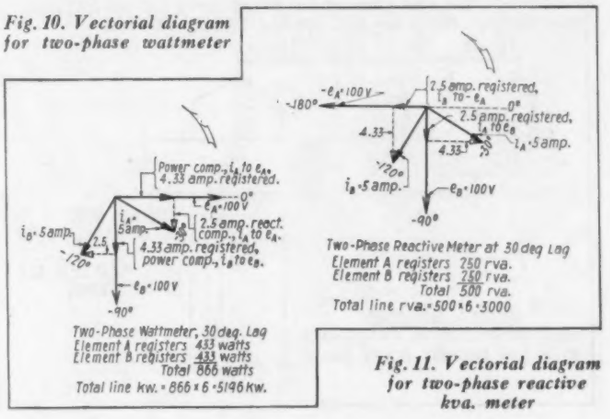
Fig. 9. shows the connections for two-phase three-wire circuit metering. It is assumed that the middle two conductors of Fig. 8 are connected together to form the "common" wire of the two-phase three-wire system. The vector diagrams and notations given in Figs. 10 and 11 are true for either a four-wire or three-wire system.

Vector relations of the currents and voltages in the wattmeter are given in Fig. 10, while Fig. 11 shows the same for the reactive meter. Line voltages were assumed to be 10 kv. and line currents to be 300 amp. lagging 30 deg., corresponding to a power factor of 0.866.

In Fig. 10 it is evident that the reactive component of current i_A with respect to voltage e_A is the same as the power component of i_A with respect to e_B, as seen in Fig. 11. Also the reactive component of current i_B with respect to e_B is the equivalent of the power component of i_B with respect to $-e_A$, that is, with respect to e_A reversed.

Reactive meters are, in effect, simply wattmeters, and each element registers in proportion to the product of the voltage used multiplied by the power component of the current with respect to that voltage. Therefore each element of the reactive meter will register forward by an amount proportional to the reactive component of the two-phase circuit.

Fig. 10. Vectorial diagram for two-phase wattmeter


Power comp., i_A to e_A, 4.33 amp. registered.
2.5 amp. react. comp., i_A to e_A.
4.33 amp. registered, power comp., i_B to e_B.
Two-Phase Wattmeter, 30 deg. Lag
Element A registers 433 watts
Element B registers 433 watts
Total 866 watts
Total line kw. = 866 × 6 = 5196 kw.

2.5 amp. registered,
2.5 amp. registered,
4.33
4.33
Two-Phase Reactive Meter at 30 deg Lag
Element A registers 250 rva.
Element B registers 250 rva.
Total 500 rva.
Total line rva. = 500 × 6 = 3000

Fig. 11. Vectorial diagram for two-phase reactive kva. meter

Similar vector diagrams may be drawn for other power factors, lagging or leading, and it will be found that each element of the reactive meter will register correctly as long as the line voltages remain numerically equal and 90 deg. out of phase with each other.

As the currents lag more the registration of the wattmeter will become smaller and that of the reactive meter greater, since the currents are getting more out of phase with the wattmeter voltages but more in phase with the voltages of the reactive meter. This may be seen more clearly if the reader will draw the vector diagrams of Figs. 10 and 11, using movable pins or match sticks for current vectors, allowing each to rotate clockwise, say 30 deg. at a time, marking off the power component for each position and noting the increase of this component on the elements of the reactive meter with increased lag. The voltage vectors remain stationary and therefore can be represented by ruled lines as in Figs. 10 and 11, the current vectors only being rotated.

To determine which element is to have its voltage reversed, the simplest way is to try them out under some convenient lagging load. Reverse the one which, under lagging conditions, gives a backward registration before reversal. When correctly connected, both elements should register forward for lagging kva. and backward for leading kva.

CORRECTION: In the second article of this series (ELECTRICAL WEST, Sept. 1, 1930), beginning at the top of page 141, text should read: ". . . which for a power-factor angle of 89 deg. amounts to 6 ohms if this resistance be considered as in series inside the condenser or to 19,650 ohms if it be considered as in parallel with the reactance of the condenser."—E.C.G.

EDITOR'S NOTE: The fourth article of this series will deal with three-phase three-wire reactive metering using phasing auto-transformers, and will appear in an early issue of ELECTRICAL WEST.

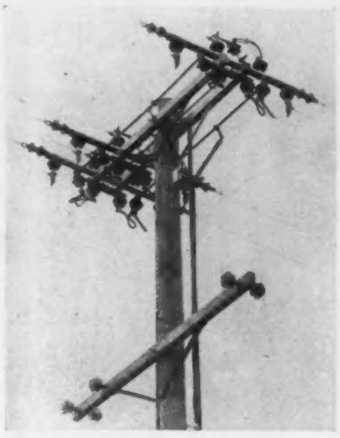
Pole-Top Re-Fusing Made Easier

By C. L. LAWRIE

San Diego Consolidated Gas & Electric Company

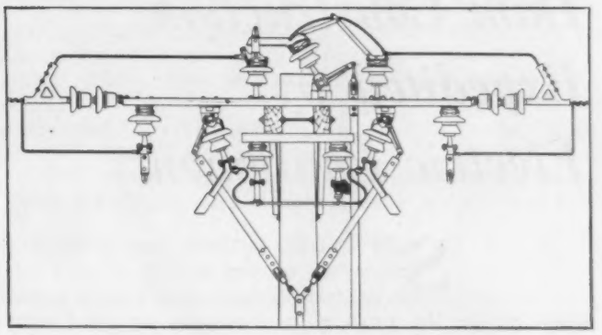
TO PROVIDE a quicker and safer method of re-fusing poletop line switches on its 12-kv. distribution lines without resorting to the use of hot-line tools and without killing the line, a new switching arrangement has been developed by the San Diego Consolidated Gas & Electric Company.

An ordinary Pacific Electric three-pole air-break line switch mounted on steel channels somewhat longer and heavier than usual is employed, with two auxiliary switches of the same type hung upside down on the under side of the same channels, one on either side of the pole. Each of these inverted switches is provided with spring clips for receiving the glass-tube fuses generally used for this class of service. These fuses form the connection between the auxiliary switches. The line is connected to the top switch as usual and at both ends just ahead of this connection the line is tapped to the auxiliary switches. One operating rod is provided for the top switch, while by means of a special Y fitting another rod operates both of the inverted switches simultaneously.



Switching arrangement devised by San Diego Consolidated Gas & Electric Company to make re-fusing easier and safer without killing the line

In operation, the upper switch is open and the current flows through the fuses by way of the lower switches, which are closed. When the fuses blow, the trouble having been cleared, the upper switch is closed and the line is restored to use. The lower switches then are opened, thus completely isolating the fuse holders from the circuit and facilitating safe re-fusing. When this has been done the lower switches are closed with a single movement, the upper switch opened, and the line is back in its normal operating condition. No switch is opened under load. It may be noted from the accompanying diagram that the assembly is so designed that the fuse holders are well below the line and are directly under the crossarms within easy reach of the trouble man.



New method of pole-top switch assembly

In the set-up of an 11-kv. metering outfit, to which the switch is particularly adapted, the instruments are connected in place of the glass fuses, but are mounted on a platform at a lower level, where they are more accessible. In the particular case shown in an accompanying illustration the metering station had been designed as a two-pole structure, but it was found that by substituting the new switch for the three separate ones hitherto employed, the whole outfit could be installed on one pole.

The triplex switch is intended to supersede, in some cases, the combination of a pole-top line switch with two separate upright units. Among the advantages expected from its introduction are reduction of "time out," increased safety of servicing, conservation of vertical pole space, greater rigidity of the whole assembly (using two crossarms instead of six), and some savings in cost and weight as compared with those of three separate switches.

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Special Tools Facilitate Hot Line Work

NEW 60-ft. poles were installed on a 55-kv. line in Puyallup, Wash., recently, while the line was hot. This work was accomplished by picked workmen of the Puget Sound Power & Light Company using Safety Live Line tools. It was necessary to disconnect the conductors from the old poles, and to hold them apart with "fuzz sticks" and specially insulated handlines while the new poles were raised between them. The conductors then were tied in on the new insulators with the "mechanical hand."

Dam Construction Expedited by Electric Equipment

SUSPENDED by cable over a cliff high above the canyon floor in a small pilot house, an operator of a remote control panel guides the work of construction on the Owyhee dam in eastern Oregon. From this vantage point he has a most commanding view of the work and directly controls the concrete delivery. Through electric control circuits he guides a unique head tower which travels on rails through a wide arc, thus "sweeping" the entire dam with overhead cable-way.

Modernly all-electric, the equipment in use at Owyhee has nearly all been especially constructed.

Operating machinery, with the exception of the remote control panel, is housed in the traveling headtower. This is of standard Lidgerwood type about 65 ft. in height, 50 ft. long, and 40 ft. wide at the base. Rock ballast, 265 tons, in the bins on the counterweight side, brings the total weight to about 400 tons.

Traveling on a 550-ft. track consisting of five lines of 100-lb. rails, the headtower, on the east side of the gorge, swings on an arc of a circle of 13,000-ft. radius centering at the stationary tailtower on the west side. This range of movement was selected to permit the bucket to dump concrete directly into place on all parts of the structure. Elevation of the cableway is such that the lowest point of the span on which the bucket rides is 30 ft. above the highest concrete surface in the finished structure. A half-million yards of concrete will be placed with this equipment.

Running the motor hoist with its two 54-in. drums equipped with friction air brakes is a 400-hp. motor. The friction brakes are at all times held against the drums unless released by the controller. Manipulation of the motor control, including brakes, is by air pressure; valves are actuated by solenoids connected by 440-volt lines to the remote control panel. Two 15-hp., automatic air compressors and a pair of receivers maintained at 50 lb. per sq.in. pressure provide the air supply.

Other equipment in this headtower includes transformers to step down 2,300-volt current to the voltage required in the operating units. The headtower is moved along its tracks by a 75-hp. motor which is geared to give a maximum speed of 200 ft. per minute. Movement is effected by rotating a drum in the tower around which are six turns of a cable fastened at both ends of the track.

Movement of the headtower will be required in the placement of almost every batch of concrete in the dam. It was therefore considered desirable to have the operator who controls the movements of the buckets located where he would have close view of the work rather than having operating signals relayed to the distant headtower. It was for this reason that the "cliff house" was erected for the operator.

Six levers are on the remote control panel in the pilot house, five for the speed, friction, and brake releases of the load control, and one for tower movement. The panel is served by 25 wires bound in a single cable extending from the pilot house to the equipment in the headtower. Of these, twelve are for the haul line, twelve for the tower travel, and one for the telephone.

Construction of this dam is a $17,000,000 project undertaken by the government for irrigation purposes. Nearly 250 ft. high, and with a crest length of some 1,500 ft., the structure will back up the Malheur River for 52 miles, the stored water covering 120,000 acres.

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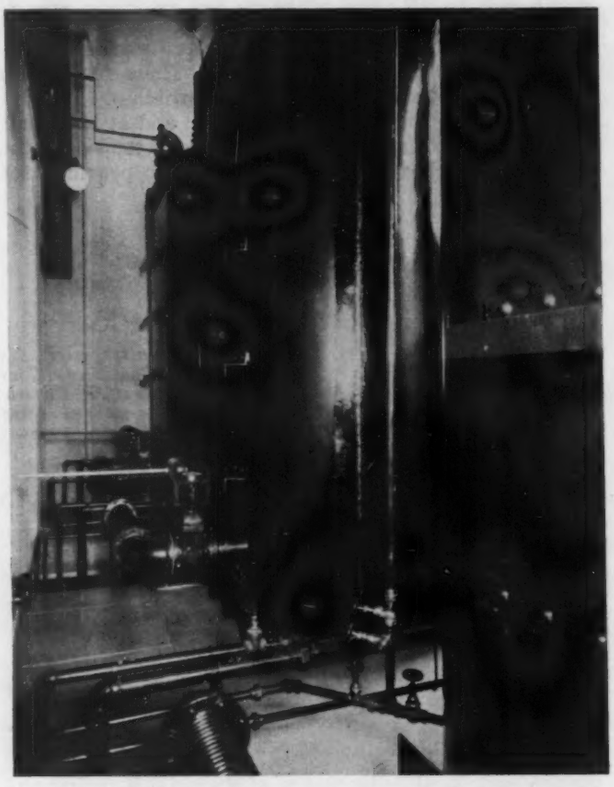
Flexible Connections for Large Transformers

SPECIAL attention is given by engineers of the Los Angeles Bureau of Power and Light to providing flexible connections, both mechanical and electrical, for the large transformers installed in power plants and substations. This has been found to be a definite advantage in connection with initial erection and where maintenance work is required subsequently. Further, flexible connections have been found to act as "shock absorbers," preventing broken flanges or fittings with the consequent possibility of service interruptions.

Heavy current-carrying leads are made up of either flexible copper cable or several thicknesses of thin copper



Flexible connections for large transformers. Note the offset electrical leads and the 6-in. flexible steel, seamless-hose oil drain connection. Another safety feature is the drain-valve operating rod which goes through the wall to an adjoining room

strap, which gives a laminated connection of sufficient capacity without too great rigidity. Where they are permissible, of course, long leads of copper tubing give the desired flexibility with the necessary safety.

Mechanical connections, such as the large oil drain pipes, are made with flexible steel hose of the accordian type and have proved particularly advantageous. Small pipes of 2½-in. diameter or less are considered to be sufficiently flexible in themselves.

Pole Painting Made Safe

By FRANCIS CURTIS
The Southern Sierras Power Company

SAFETY in trimming and painting poles at the Riverside plant of The Southern Sierras Power Company has been enhanced by the construction of a rack consisting of two carriages mounted on wheels for operating on a railroad spur between two permanent pole racks. These carriages are placed in position, one at either end of the pole, and skids with flanged sides, which eliminate all chances of slipping, are laid from the carriage to the rails forming the permanent rack. The poles are then rolled over the skids to the carriages.

The trucks were made up from two existing 300-kva. transformer trucks upon which were welded angle iron frames 48 x 56 x 30 in. high. The all-welded frame is made up of 3 x 3 x ¼-in. angle iron. Each truck is equipped with 12-in. cast iron flanged wheels spaced for a 56½-in. standard rail gage. As shown in the accompanying illustrations, two cast iron rollers, each 4½ in. in diameter and 10 in. long, are mounted on the top of the truck. These serve as rests for the pole and aids in rolling over the pole while work is being done on it. Skids used to roll poles from the pole rack to the trucks are 6-in. channel iron sections.

These trucks, which cannot slip or move during painting or draw-knife work, were made at a cost of about $30.

The picture at the top shows the construction detail of the truck mentioned in the above article. The rollers on which the pole rests and turns can be seen on the left side of the truck. The channels used to roll the poles off the truck and into the storage section are hooked to the side of the top flange as seen. The lower picture shows the apparatus as it stands between the two piles of poles. The trucks are mounted on rails for ease of transmission and to compensate for different length poles. The cost of each truck was about $30

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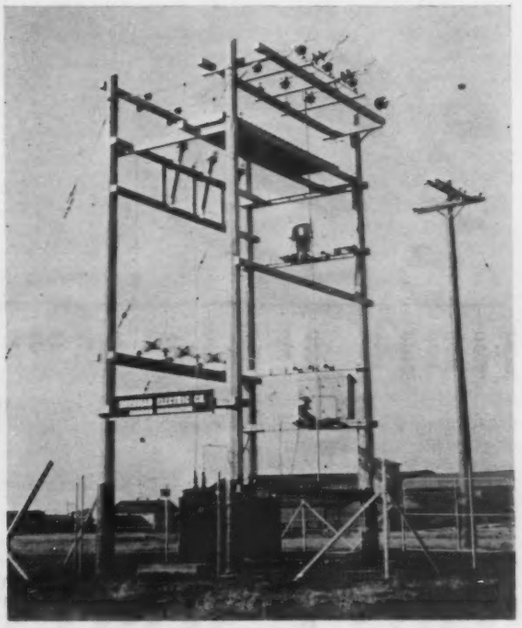
An Oregon Rural Substation



CONDON (Ore.) substation of the Sherman Electric Company, a 22-kv., 200-kva. installation typical in construction style for this class of service. Wooden pole construction differs from that of steel in other rural substations in the West.

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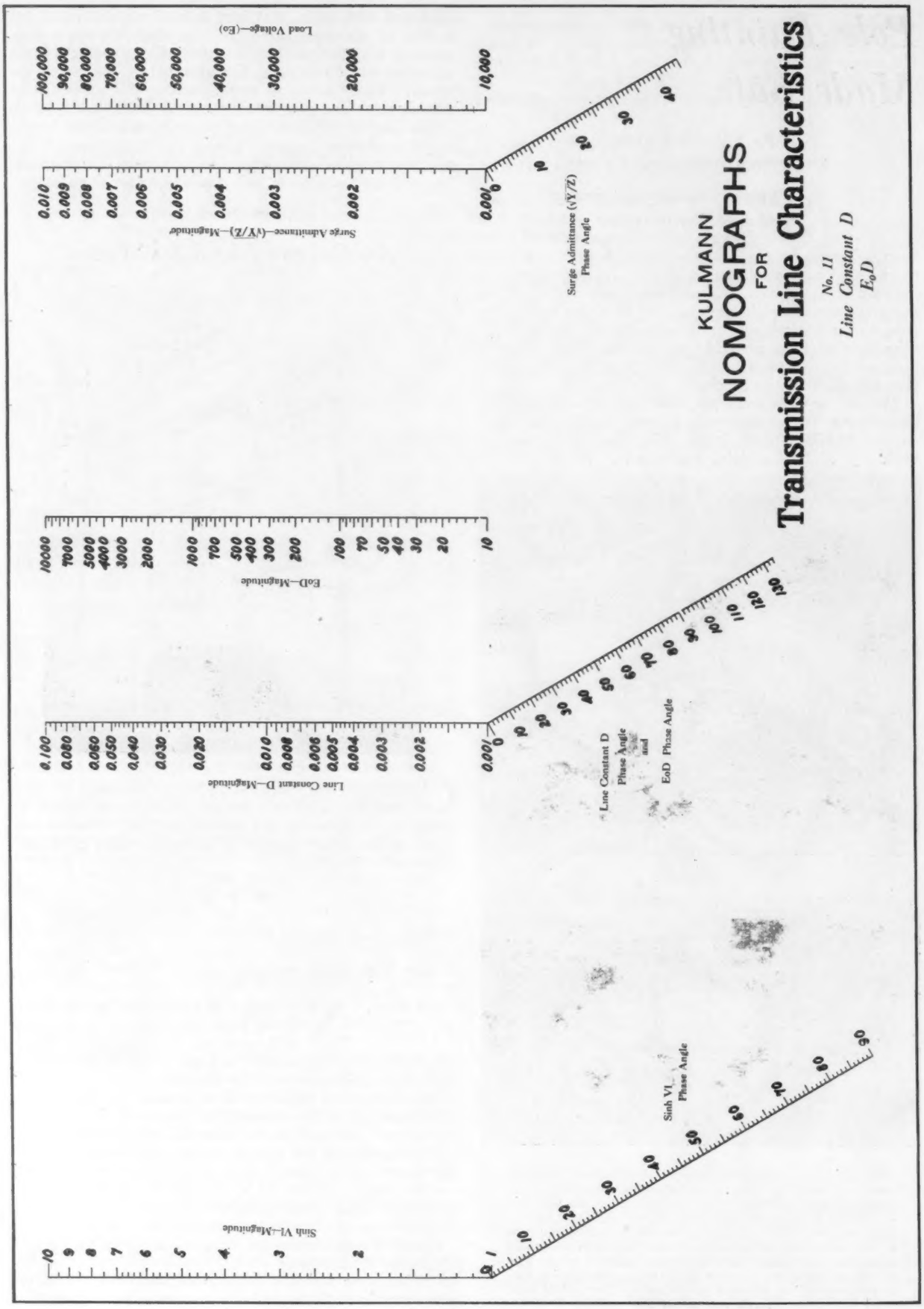
"Safety First," or Turkey vs. Beans

NOVELTY in promoting safety measures among employees is the keynote of a series of "fewer accidents" campaigns held in the distribution department of the El Paso Electric Company every three months.

Two teams are chosen with a captain for each. At the expiration of the contest that team with the greatest number of accidents to its discredit pays the bill for a banquet at which the winning team eats turkey and the losers eat beans. Three tables are arranged, one for the turkey eaters, one for the losers, and the third for those who are responsible for accidents on either team. At the latter table crepe is appropriately used for decoration.

Company officials declare that continuous presentation of the safety theme in such a humorous fashion is responsible for a material decrease in the number of accidents among employees.


KULMANN
NOMOGRAPHS
FOR
Transmission Line Characteristics
No. 11
Line Constant D
E_0D
Load Voltage—(E_0)
Surge Admittance ($\sqrt{Y/Z}$)
Phase Angle
Surge Admittance—($\sqrt{Y/Z}$)—Magnitude
E_0D—Magnitude
Line Constant D—Magnitude
Line Constant D
Phase Angle
and
E_0D Phase Angle
Sinh Vl
Phase Angle
Sinh Vl—Magnitude

Transmission Line Nomographs

No. 11. Completion of Graphical Solution for Obtaining Numerical Value of Second Term of Current Characteristic Equation

By C. ALBERT KULMANN
Pelton Water Wheel Company, San Francisco

BY MEANS of the accompanying nomograph, No. 11 of the series for the determination of tranmission line characteristics, and No. 10 (ELECTRICAL WEST, Sept. 1, 1930), is evaluated the second term of the current equation:

$$I_1 = I_0 \text{ Cosh Vl} + E_0 \text{ W Sinh Vl}$$

where

I_1 is the generator current, I_0 is the load current, E_0 is the load voltage, V is the hyperbolic angle of one mile of line, l is the line length in miles, and W is the surge admittance of the line, being the square-root of the result of dividing the line admittance by the impedance. All of these quantities except l are vector quantities, the angles being measured with respect to E_0.

In the second term of the equation, E_0 is known, W was determined by means of chart No. 10, and Sinh Vl by means of No. 7 (ELECTRICAL WEST, July 1, 1929), and in this chart the product of the three vector quantities is obtained.

As has been pointed out earlier in this series of articles, for a given line the current equation becomes

$$I_1 = I_0A + E_0D,$$

A and D being constants of the line. In this nomograph the constant D is first evaluated, and the remainder of the term then may be determined for various values of E_0 without going farther back in the computations.

To use the chart, as with earlier charts, multiplying factors may be necessary to bring the quantities within the ranges of the various scales. For the magnitudes of the vectors this is a process of multiplication, and for the angles one of addition. Thus, the value (magnitude) of Sinh Vl, as found from chart No. 7, may be multiplied by some power of 10 which will give a result between 1 and 10, and the corresponding point is located on the scale. The value (magnitude) of surge admittance also is brought within the range of the scale by using the same or any other multiplier, and the corresponding point is located. Joining the two points with a straight-edge gives the value (magnitude) of line constant D from the corresponding scale. This then is multiplied by the reciprocal of the product of the two multipliers previously used, to arrive at the true value.

Proceeding, the point found for the value of line constant D then is connected with the scale value of the load voltage. If this does not fall between 10,000 and 100,000, a multiplier again is used and the value of E_0D (magnitude) as read is then multiplied by the reciprocal of the product of the three multipliers previously used.

Turning now to the angular value of the vectors, the phase angle of Sinh Vl may lie outside the range shown, in which case 90 deg. or some multiple thereof is subtracted from the true value to bring it within the limits of the nomograph. The corresponding point is located on the Sinh Vl—Phase Angle scale and connected with the proper point on the Surge Admittance—Phase Angle scale by means of a straight-edge. The value of the phase angle of line constant D, and E_0D, is read, the two being the same inasmuch as E_0 is the reference vector and has zero angle. To this result is added the angle previously subtracted from the true value of the phase angle of Sinh Vl to obtain the true angle of line constant D, or E_0D.

EXAMPLE

To illustrate the use of the nomograph, take a case where E_0 is 66,000, the angle being, of course, zero, W is 0.0022 at an angle of 7 deg., and Sinh Vl is 0.4 with an angle of 85 deg. Of the values of magnitudes, the first and second lie within the range of the scales, but the third must be multiplied by 10 to bring it between 1 and 10. Locating the values of W and Sinh Vl (magnitude) on their respective scales, and joining with a straight-edge, line constant D (magnitude) is read, but the reading must be multiplied by 0.1 to obtain the true value of 0.00088. The point found then is connected with that corresponding to the load voltage, 66,000, and the value of E_0D (magnitude) is read, but this too, must be multiplied by 0.1 to obtain the true value of 58.

The angles fall within the limits shown, and by connecting the corresponding scale points, the value of the phase angle of line constant D and E_0D is read as 92 deg. Since no multiplier was necessary to bring the previous angle values within the scales, this is the true figure and, for the case cited, the second term of the current equation is a vector quantity having a magnitude of 58 and an angle of 92 deg. with respect to the load voltage.

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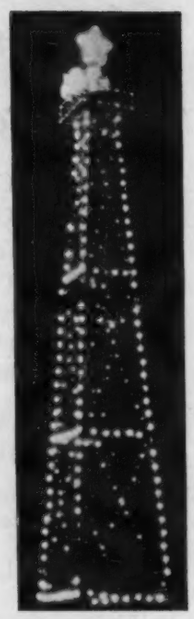
New Books

TOWARD CIVILIZATION, edited by Charles A. Beard, editor of "Whither Mankind?" Cloth-bound; 5½ x 8½ in.; 307 pages. First edition. Published 1930 by Longmans, Green & Company, New York, N. Y. Price $3.—This volume is a view of modern civilization, but from an entirely different angle from that of "Whither Mankind?" which advanced the thesis that the so-called Western civilization (as distinguished from other cultures) really is a technological civilization resting upon science and machinery. In this volume, "Toward Civilization," a group of scientists and engineers present the "case" of this technological civilization from a viewpoint of the "insiders looking out." This volume is significant as a disclosure of technical tendencies, as a sign of deep stirrings among the members of the engineering fraternity, as the promise of a wider co-operation among the makers of our machine civilization, and as a revelation of the engineering mind to the lay public. Its chapters include such headings as, The New Age and the New Man, Science Lights the Torch, Power Transportation, Communication, Agriculture, Engineering and Government, Work and Leisure, Machine Industry and Idealism. Contributors include such men as Robert A. Milliken, Elmer A. Sperry, Lee deForest, Michael Pupin, and other eminently qualified persons.

STREET LIGHTING PRACTICE, by Ward Harrison, O. F. Haas, and Kirk M. Reid, respectively director of engineering, Edison Lamp Works, assistant general manager, Atlantic Division, and member of the engineering department, Edison Lamp Works, National Lamp Works of the General Electric Company. Cloth bound; 6 x 9 in.; 270 pages; profusely illustrated. First edition. Published 1930 by McGraw-Hill Book Company, Inc., New York. This book for sale by McGraw-Hill Retail Book Depository, 883 Mission St., San Francisco. Price $3.50.—This book brings together between its covers a collection of information pertaining to street lighting practice that its authors have gathered through several years of practical work. Its subject matter ranges from problems of a purely engineering character such as the choice of equipment, the proper location of lighting units, and selection of the type of circuit, to problems pertaining to contracts and financing. Extensive charts, illustrations, and light distribution curves are included and represent particular care in the selection of useful data in convenient form. The content is divided into 22 chapters with five appendices dealing with related matters. A few of the chapter headings include: A View of the Problem, The Value of Street Lighting, Illuminants (three chapters), Circuits and Their Control, Factors Affecting Visibility, Lighting Plans for Thoroughfares and for Residence Streets, Highway Lighting, Systematized Maintenance, Methods of Financing, and Contracts and Specifications.

Commercial



Even oil derricks assume a holiday air in southern California

Christmastide Lighting Comes Outdoors

Streets Blossom With Colored Brilliants and Homes Trim Outdoor Trees and Gardens. Typical Scenes of 1929

Nancy Carrol, screen star, pushed the switch which lighted Los Angeles' Christmas decorations last year

The Eccles building, in Ogden, Utah, was outlined with lights. This proved good business for it made the edifice stand out among many others

One hundred and twenty-four huge red, white, and green towers, such as that on the left, decorated principal Los Angeles corners. Affixed to lighting standards, these decorations sparkled with artificial snow and ice, the effect enhanced by individual lighting systems. Christmas carols were broadcast four hours each day from a private station through dynamic speakers on each tower. The cost of the scheme, with huge wreaths hung at each corner, was $125,000. Salt Lake City decorated its standards with red and green celophane shades and merchants contributed strings of lights and decorated trees. The effect may be seen in the picture on the right. Below, a special fixture was placed on every other street light in Fresno, Calif., and standards were strung with wreaths and holly. Nearly every city was decorated to greet St. Nick.

Many cities hold contests for outdoor house decorations. At Watsonville, Calif., the W. Rupert home, pictured on the left, was adjudged the best. Floodlights and a maze of small lamps did the job.

This Portland display, winner of first prize among homes in that city, was viewed by an estimated 500,000 people in the ten days it was shown. A 60-ft. painted scene portraying Portland with Mt. Hood in the background was stretched across the front porch. By unique lighting, three scenes were developed—Christmas Eve, midnight, and Christmas Day. Hymns and carols were played on a phonograph

Still another Portland home which won a prize is this. Trees and shrubbery, sufficiently lighted, make a charming scene with Santa climbing down the chimney

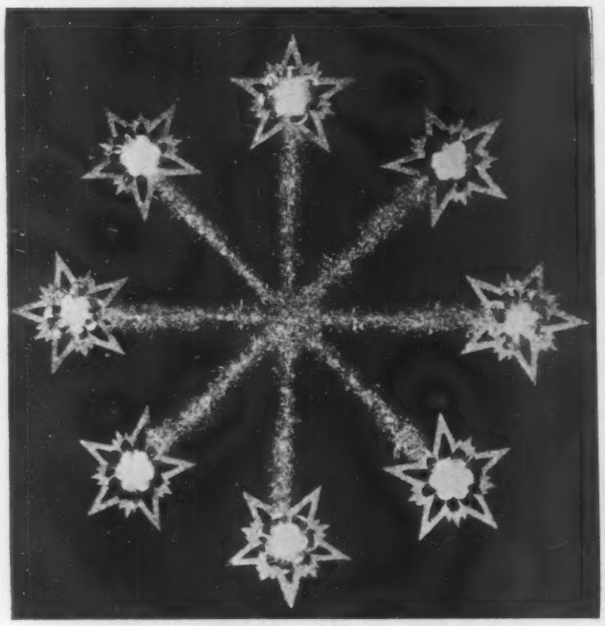
In the belfry of old Mission San Juan Bautista, the Coast Counties Gas & Electric Company, Santa Cruz, installed a beacon to flash a Christmas call to the countryside. Floodlights made a beautiful picture of the old church

Watsonville's Catholic church built this scene of "The Nativity" outdoors last year. Even to the housing (of old boards in the shape of a stable) the effect was exact

Inexpensive Homemade Decorations

SIMPLE window decorations, with a lighted Christmas tree, lend charm to the embellishment of the home. A few novel designs made of inexpensive materials obtainable in any store, not too complicated to be made by children, create a festive atmosphere.

From "Tinker Toy" sets which almost every child possesses may be made innumerable window ornaments. The star shown in an accompanying illustration was made with "Tinker Toy" as a foundation. The pegs were covered with tinsel and stars were affixed to the ends. To this was attached a Christmas tree lighting outfit. Small



Inexpensive Christmas star made with "Tinker Toy" as a base

seals were placed on the tip of each arm around the light bulb. Many other novel designs may be made with this "Tinker Toy" base, offering an absorbing game for children.

Candle decorations may be made with mailing tubes of various sizes on some kind of base. The mailing tube with a plain lamp inset in the top may be covered with silver or gold metallic paint and fastened behind a piece of heavy cardboard of modernistic shape. For a mantle or table decoration illuminated bowls and centerpieces are excellent. A glass bowl may be purchased for 5 or 10 cents, and filled with transparent, artificial flowers. Two 10-watt lamps in color are used, one in the bowl and one placed upright among the flowers.

Small lamps may be placed in the packs of toy Santa Clauses, the inside of a red paper bell may be cut out, and a small red lamp hung there for a clapper, and many other clever decorations may be achieved with inexpensive materials and a little ingenuity.

So popular were these ideas when advanced to its customers during the last holiday season that the Utah Power & Light Company, Salt Lake City, is planning to conduct classes, starting during the early part of November, in which free instruction will be given in the making of lamp shades and such ornaments as those described above.

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Community Bands To Decorate Tree

NEIGHBORS of M. S. Steel, 721 Mandana Blvd., Oakland, Calif., last year raised $122 with which to buy 240 40-watt Christmas tree lamps to decorate a large cypress tree in front of Mr. Steel's residence. Because the number of lamps was insufficient to cover the large tree completely a drive is being made this year to buy 200 more. Each of the neighbors is asked to contribute not less than $1 nor more than $2. The lamps remain community property and are used from year to year.

Mr. Steel pays for the current used for the twenty days the lights are lit, the Clyde L. Chamblin Company loans the streamers and sockets, and the Pacific Gas and Electric Company decorates the Christmas tree.

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Advertising Small Merchandise

SMALL Christmas merchandise is sometimes difficult to display in a newspaper advertisement, but the Southern California Edison Company, Ltd., used this effective presentation in a Long Beach, Calif., paper with success. Each item is clearly pictured and explained and the assemblage is arranged to form an "X", standing for Christmas. Sales efforts were directed toward both the neighborhood appliance dealer and the company stores.

Grid Tube Attracts Customers

CROWDS of children and adults waited in line to touch the "magic button" on this Public Service Company of Colorado (Denver) window. The touch of a human finger on a disk actuated a Westinghouse glow tube which, in turn, operated the toy airplane at the right of the tree. This novelty attracted many passers-by to the effective display of holiday equipment.

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"LIGHT up a living tree" urged an advertisement of the Midland Counties Public Service Corporation, of Fresno, Calif., last year. The corporation co-operated with service organizations and clubs in promoting the use of outdoor Christmas trees and gained popular support for its campaign.

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Boise Window Wins Hotpoint Prize

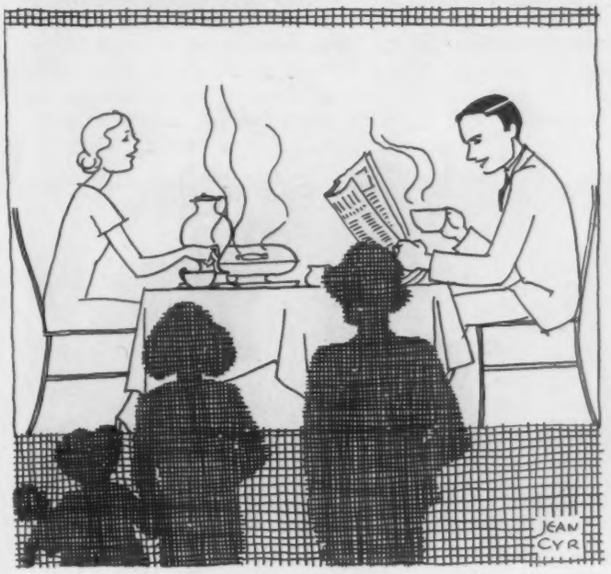
THE prize winner among all Hotpoint window displays for Christmas last year was this window of the Boise Electric Shop of the Idaho Power Company. Steward J. Gray of that company was the designer.

Ten "Hotpoint Red Men" in turn hopped out of Santa Claus' open gift sack and traveled up the incline finally to disappear behind the range. Each "Red Man" carried a card containing one of the selling points of the range. The display was managed by means of a small 1/6-hp. motor which ran a chain turning on two pulleys.

Living Breakfast Display Builds Pre-Christmas Sales

PRE-CHRISTMAS sales of electric appliances in Twin Falls, Idaho, last year were far ahead of those of any previous year as the result of a breakfast demonstration in the window of the Idaho Power Company in that city.

For the weeks before Christmas a breakfast nook had been constructed in the window and a table daintily set for breakfast with a waffle iron, percolator, toaster, and egg cooker included. Demonstrators enacted the roles of wife and husband, the wife cooking and serving a complete breakfast without leaving her chair.



Show window breakfasting which attracted pre-Christmas purchasers

This daily living display drew large crowds to the company's sales rooms.

Attention of customers was drawn to a range campaign by the same company through a playlet, "The Electric Cooking Party," presented at one of the local theaters.

The setting was a model kitchen with all the essential furnishings, including an electric range. Three women, local and out-of-town demonstrators, were the characters in the skit, in which Mrs. Housekeeper was invited to a show by a friend. Dialogue presented the picture of the housewife, confident that the electric range would prepare her dinner as well in her absence as if she were watching, leaving for the afternoon. When she arrives homes, the dinner is perfectly cooked. Lines in the playlet included recipes for the many oven dishes prepared on the stage.

Numbered tickets were given out at the ticket window and the holder of the lucky number received the dinner. Adjournment was made to a range sale in the showrooms of the company.

When Is an Account Paid in Full?

By Ross Dudley
Attorney, Salt Lake City

MR. A, PROPRIETOR of the A Electrical Company, owed a certain supply company $850. The creditor threatened to file involuntary bankruptcy proceedings against him if the account was not settled in full by the tenth of the month. A collected $600 in cash and offered to pay it to the supply company if it would accept that amount in full payment of the account. The creditor accepted, received the $600, and gave A a receipt in full.

Two years later A, having become prosperous, was notified that his bank account had been garnisheed by the

supply house for the balance of $250. A retained an attorney and the case went to trial. The trial judge promptly gave the supply company a judgment for $250 and court costs, holding that a payment of $600 was not full settlement for an $850 debt regardless of the receipt, as there was no consideration for the unpaid balance. The decision has been upheld in a number of other cases.

Since this is the case, how can a compromise settlement be made with a creditor or creditors, so that it will be a bar to future actions for the balance?

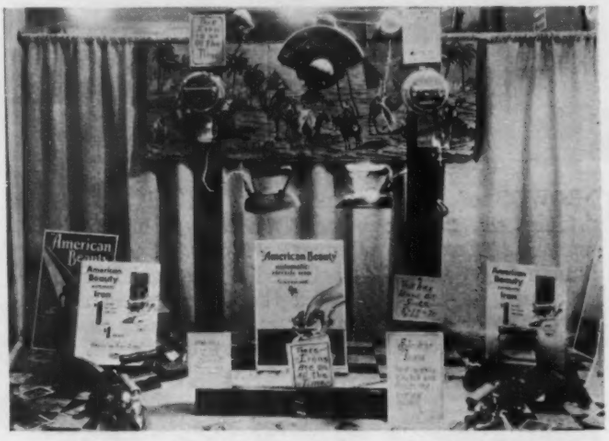
If the settlement is to be made with two or more creditors, the best way is to draw a written agreement, known as a composition with creditors, providing that each of the signing creditors, in consideration of the other creditors' agreement to accept a smaller sum than is actually due, shall accept a certain specified pro rata or designated sum. The courts uphold this kind of settlement on the theory that the promise and mutual acceptance of the smaller sum by all the creditors is sufficient consideration.

In settling with only one creditor it is necessary to give some independent consideration in addition to the money paid, if the smaller payment is to be legally good for the larger amount. Even a fountain pen, watch, or some other article of merchandise is generally upheld as good consideration for the balance, for the courts do not inquire into the value of the article.

New Display Ideas Sell Irons

NOVEL advertising methods are sometimes necessary to sell such a universally possessed article as an electric iron. The Puget Sound Power & Light Company, during a recent campaign on American Beauty automatic irons, however, proved that when new ideas are employed, irons can be sold.

For instance, the Bellingham (Wash.) office made use of the display shown in an accompanying illustration. A



This novel test was made at Port Townsend. The new automatic iron easily out-performed the older iron

Port Townsend display used two irons, one an old non-automatic and the other a new automatic. Both irons were connected at the same time and left untouched for weeks. The old iron was red hot all the time. It used 275 kw.-hr. while the automatic kept an even ironing temperature and used but 36 kw.-hr. Curiosity of townspeople was invoked by this display. The announcement of the figures was effective in boosting the sale of irons to a large extent.

Seattle offices received a prize for the greatest percentage of quota sales during the month of the campaign. The month's quota of 96 irons was passed with the sale of 102 in the first three weeks.

Bellingham (Wash.) office of the Puget Sound Power & Light Company used this display to sell electric irons

Portable Range Cabinet

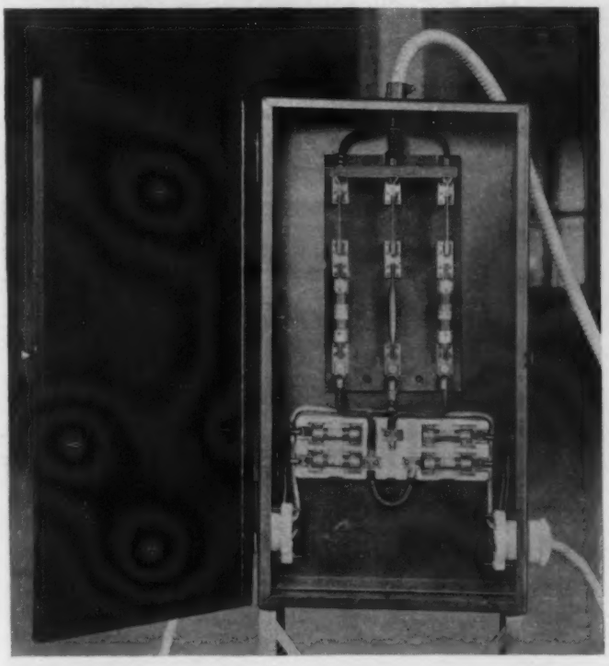
By A. O. BORDEN

Range Service Department, Pacific Northwest Public Service Company, Portland

IT IS frequently necessary to connect one or two electric ranges for demonstrations in churches, public halls, and other places where a service of sufficient capacity is available, but where no range wiring is provided. To facilitate connections of this kind, the range service department of the Pacific Northwest Public Service Company, Portland,

Portable range cabinet constructed by the Pacific Northwest Public Service Company, Portland, to demonstrate electric ranges in places where no range wiring is provided

has designed a portable cabinet with outlets for two ranges. This cabinet contains a 100-amp., 3-pole, solid-neutral switch; two 50-amp. fuse blocks; and two 3-pole range receptacles. A sufficient length of armored cable is provided for connecting the cabinet to the service, as shown in the photographs. Ranges to be used are provided with flexible cords and polarity plugs.



The range cabinet has outlets for two ranges, as shown, and contains a 100-amp., 3-pole switch, two 50-amp. fuse blocks, and two 3-pole range receptacles. It is light and portable

The dimensions of the cabinet are 30 x 16 x 6 ft.; it is constructed of spot-welded sheet iron, mounted on reinforced angle-iron legs, and finished in black duco.

This portable set-up can be connected, ready for use, in considerably less time than was formerly required to improvise a temporary connection. In safety, as well as in appearance, it is a distinct improvement over the old method.

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Refrigerators Go Parading

IN NEW ORLEANS it may be the Mardi Gras, but at Wenatchee, Wash., the big event of the year for all surrounding country is the Apple Blossom Festival. Flower-and-blossom-bedecked floats parade through the town; firms, organizations, and towns vie with one another to present the most beautiful and original idea.

Novelty was the note sounded by the eastern district of the Puget Sound Power & Light Company in its parade display of General Electric refrigerators at the eleventh annual festival, held recently. The accompany-

ing illustration shows the file, which evoked much comment from the spectators. As it was an especially hot day the thought of refrigeration was quite timely.

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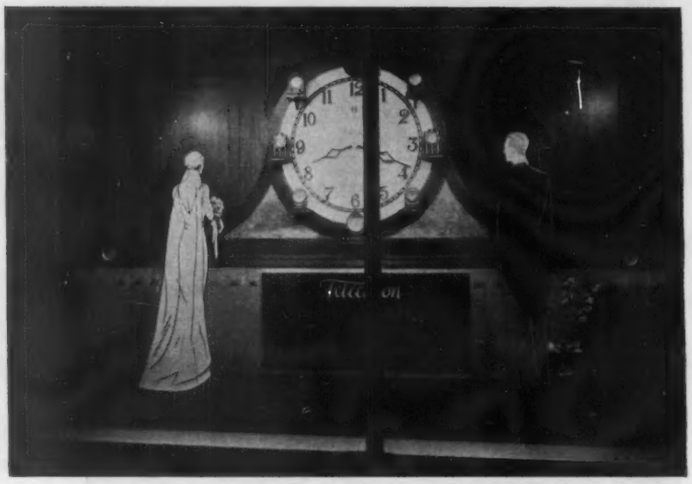
"Dream Home" Scrap Book Realized

EVERY man and women plans some day to build a home, and constantly is on the lookout for ideas which might be incorporated in the plans. Cognizance of this innate desire was taken by the Los Angeles Bureau of Power and Light in the publishing of a booklet in which pictures, sketches, and plans for any room might be collected and kept. The booklet is divided into sections according to the rooms. Each section presents a message on the proper decoration of that room, with typical wiring plans to allow for any emergency. Then follow numerous blank pages for the pasting of clippings which the user wishes to keep. The contents impress upon the reader the necessity and advantages of a completely wired home and offer the Bureau's assistance in wiring plans and in the selection of appliances at its display rooms, where all appliances are demonstrated but none are sold.

Contest Evokes Clever Window Decorations

Telechron's June Bride Competition Entered by Ninety Dealers



First prize was given Ralph Pfister for decorating this MacSongan Southwick department store window in Seattle

RESPONSE from 90 dealers in a Pacific Coast window display contest is almost a high percentage record, but such was the success of the June Bride window display contest featuring Telechron clocks, a competition recently sponsored by the General Electric Supply Corporation. The results have convinced the distributors that the contest should be held again next year, according to Eugene Garcia, assistant to the vice-president. However, slight changes in procedure will be effected.

The contest was designed to reach those who would be buying wedding gifts for the June bride of 1930 or anniversary gifts for the June brides of previous years. Special display material was made available and a newspaper campaign was released simultaneously.

Rules in this contest were simple. Dealers were requested to put in a display of Telechrons between May 1 and June 30 featuring these electric timepieces as (*a*) gifts for the bride, (*b*) gifts for anniversaries, and (*c*) "new time for new homes," and then to send a photograph of the window to the nearest General Electric Supply Corporation office before July 5.

This window won second prize for J. W. Johnson, display manager of Power Furniture Company, Portland

Six cash prizes were awarded, ranging from $100 for the window adjudged best to $10 for the sixth best. Eight other firms were given honorable mention for superior decoration.

The judges of the contest were: George C. Tenney, editor, ELECTRICAL WEST; Lewis G. Watson, N. W. Ayer & Son, San Francisco; and Norman B. Stern, Hamman-Lesan Company, San Francisco.

Because no small merchandisers were able to compete with the larger stores in this contest, the sponsors declare that the entrants in next year's contest will be divided into classes. This will give dealers an opportunity to compare their efforts with others having the same facilities.

Besides the winners shown on this page, those on the facing page are:

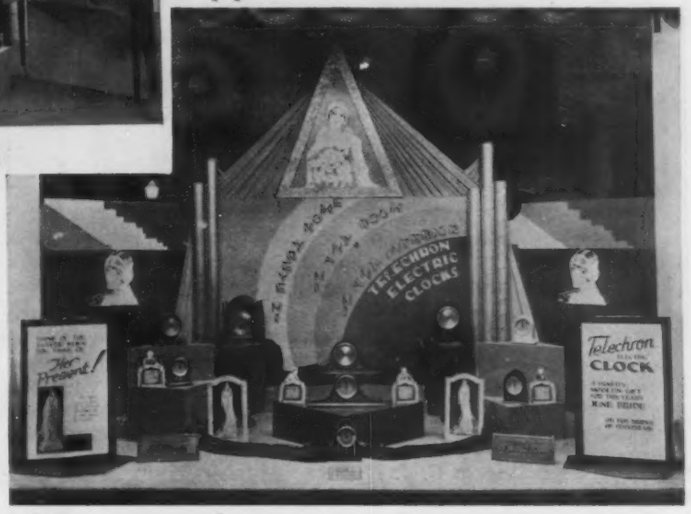
Third prize, left, The Emporium, San Francisco. Decorations by W. W. Rolley

Fourth prize, top right, Valley Electrical Supply Company, Fresno. J. U. Berry, advertising manager

Fifth prize, center right, Frederick & Nelson, Seattle. Window by J. R. Tilley

Sixth prize, bottom, Meier & Frank, Portland. O. R. Miller in charge

STRIKING is the simplicity of modern window decorations. Merchandisers know that a pretty, simple display attracts more customers than one with a variety of appeals. In the window which won first prize in the Telechron competition, shown on facing page, the clock is the center of attraction. No other feature attracts the eye away from the object displayed. Just a hint of the June bride angle is made in the sign, "Telechron, the gift they will treasure, brings accurate time to their home." A black glass floor adds striking contrast.



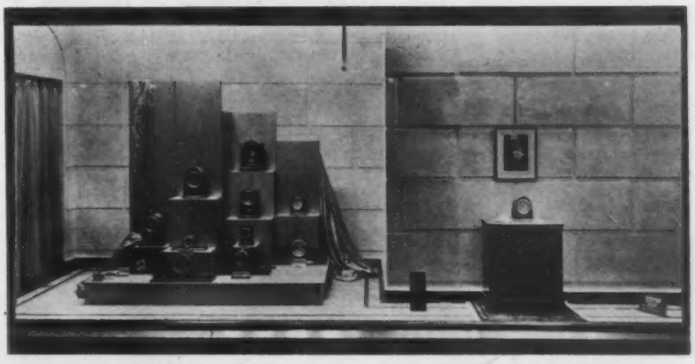
THE second prize window, also shown on the facing page, is totally different. Beauty makes this window outstanding. The central figures are the bride and groom, with the electric timepiece featured as an instrument to their happiness. Seventeen types of clocks, with price cards, illustrate the diversity of uses. A revolving light illuminated the artificial church window and a loud speaker softly played Mendelssohn's "Wedding March." Lavender, rose, blue, and yellow artificial flowers added color.

ACCURATE time was featured in the third best window scheme. Here, each clock was designated as being especially fitted for a certain household location, with the triangular display pointing to the observatory at the apex.

CLEVER balance without duplication is the impression given by the fourth prize winner. Very little expense was involved in this decorating.

SIMPLEST of all winners is that which won fifth prize. Using only covered blocks, this window immediately stands out as portraying the grace and beauty of the new timepiece. The number of designs offers the customer a wide range of choice and one design is sure to create a desire in each prospect. No extra expense was involved in its decoration, standard fixtures being used.

SIX designs were used in the sixth best window. Yet, the immediate impression of grace and modernity is gained from the use of the figure and furnishings. The use of the modernistic lettering of the name, Telechron, also adds to the impression. Each prize window tells a story all its own. Each window merits a study for its salient points. All are so simple that even the smallest merchandiser can study them, and improve his own windows thereby.

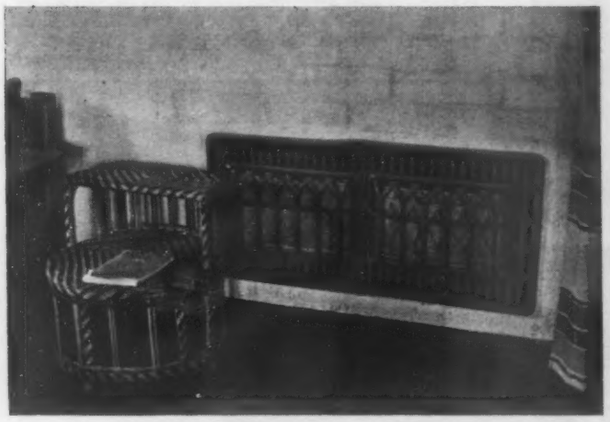


Construction

Desert or Island

Whether in a Desert Ranch Resort or in a Private Island Home, Electrification Adds to the Comfort and Efficiency of the Household

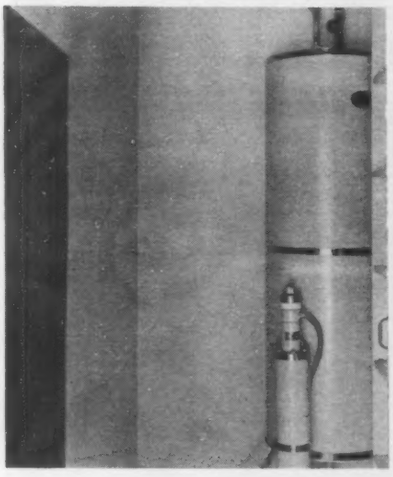
A 6-kw. closed coil heater, thermostatically controlled, in the lounge



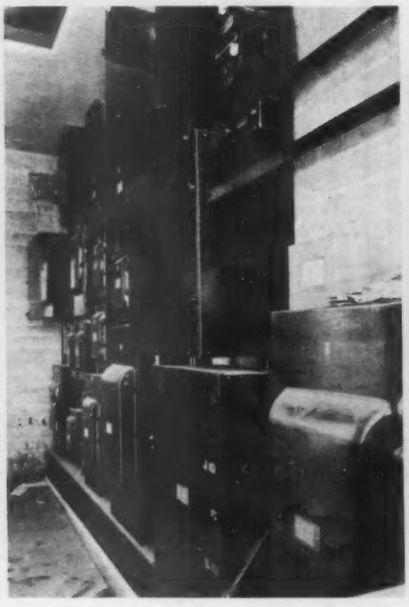
DEEP Well Ranch, near Palm Springs, in the desert Coachella Valley, Calif., has made many customers for electric heat, according to C. J. Nichols, engineer, since its success there has sent guests home determined to have it themselves. There are 91 heaters, 28 of which are 1.5-kw. and 48 3-kw., installed in the cottages of the hotel and the main buildings. The latter have thermostats for temperature control. Pictures on this page show other electrification details. Total connected load, according to The Southern Sierras Power Company, is over 500 kw. Newbery Electric Corporation, Los Angeles, made the installation, with supervision by Claire J. Bennett.

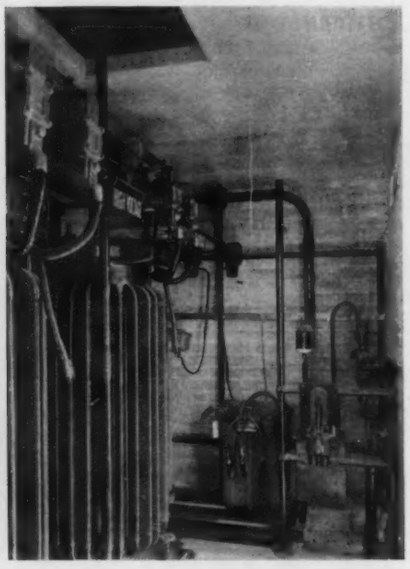
Kitchen electric equipment totals 90 kw. and consists of an urn, two water heaters, a 10-kw. oven, steam table, broiler, 38-kw. range and mixer, plate warmer, dishwasher and refrigeration plant. Provision for 108 more kilowatts of equipment was made in the wiring

Switchboard and transformer room are separated by a tile wall. The three 100-kva. transformers supply the winter heating load but are cut out during the summer season by means of a double-throw switch which transfers all load to the smaller power and lighting bank



At first used to supply all hot water to the group of cottages and kitchen, nine water heaters totaling 45 kw. are now used to maintain 160-deg. temperature in the system using oil for primary heating





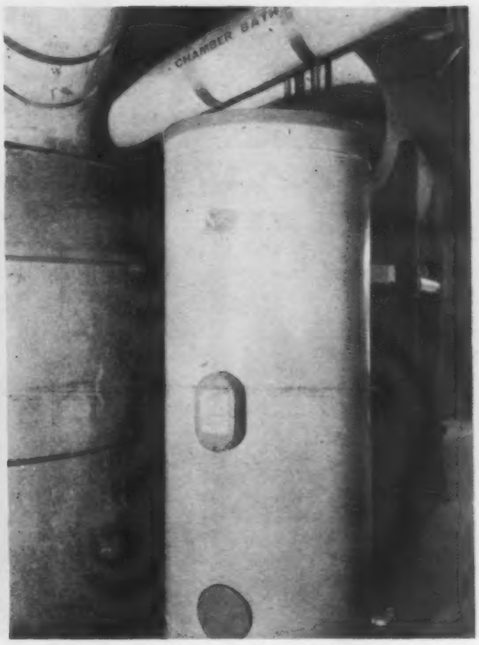
BELOW: *The servants' quarters were furnished with a 2½-kw. portable fan-type heater*

ABOVE: *In each of the many fireplaces in the old home were installed 5 or 3-kw. ornamental heaters*

BELVEDERE, Calif., is on an island in north San Francisco Bay. Many fine homes have been erected on its sloping hillside. The entire southern end of the island makes up an estate under one ownership, comprising three buildings in the midst of gorgeous gardens. Not long ago the owner, though living on the premises only part of the year, decided to do away completely with the soot which marred his beautiful gardens and homes. He commissioned Clyde L. Chamblin, California Electrical Construction Company, San Francisco, to electrify his entire group of buildings. Electric heaters were placed in all fireplaces. A large art gallery and music room was equipped with two 5-kw. portable heaters. Special individual lighting was installed over the canvasses. Other heating and electrification details are shown on this page. An old well cistern was made over into a transformer vault. All wiring was revamped and run in conduit underground. An interesting detail was in the placing of the heating circuits to all servants' rooms under remote control in the butler's quarters, from which the heaters can be turned off by him on retiring.

Water heating was a separate problem in each of the houses. In one, a storage heater was installed. In another a circulation-type unit replaced a gas heater connected to a well insulated boiler. The owner was particularly well pleased by the attractive appearance and performance of the solid-top, restaurant-type electric range installed in the kitchen of the main house.

BELOW: *In the kitchen is installed a white porcelain finished restaurant type heating surface range, a plate warming oven, a double waffle iron and a 5-kw. circulation type water heater connected to the well insulated boiler formerly installed.* RIGHT: *A 100-gal., 3-kw. storage heater replaced the wood and coal heated boiler previously used to supply one of the homes on the estate*

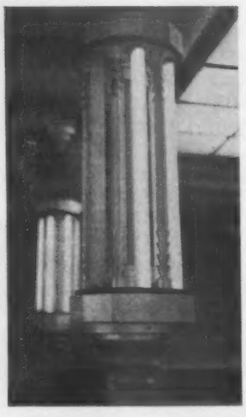


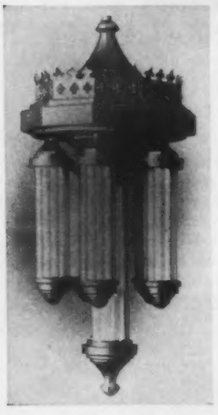
Neon Lighting Enters the Home

Outdoor Advertising Uses of Neon Are Familiar to Everyone, but the Entry of Gaseous Illumination Into the Domestic Lighting Field Is New

A mountain studio, pictured above, is lighted with chandeliers composed of groups of different colored Neon tubes to give a full spectrum effect. A closer view of the chandelier is on the right. These fixtures have been developed by George Meyers, of the Electric Products Corporation's Los Angeles office

INTERIOR lighting now reaches toward better quality rather than greater quantity. It demands concealed or diffused light, in keeping with the trend toward soft beauty in the home. Neon tubes in the home pictured above were concealed in the alcove, effectively setting off the distinct, modern furnishings



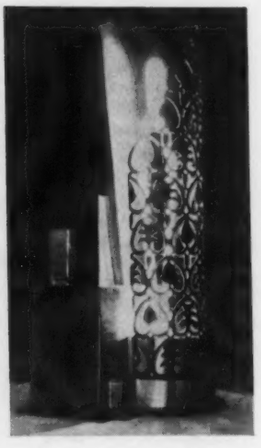


Another type of Neon chandelier lights this room in a Los Angeles home. Neon lighting is being perfected for all types of interiors. Architects and contractors have already learned of outdoor decoration of waterfalls, pools, fountains, and gardens by Neon. Lamps and wall fixtures are new products

Neon tubes in a wall fixture

Rainbow Isle, Los Angeles cafe, with Neon effects

Desk lamp lighted by Neon



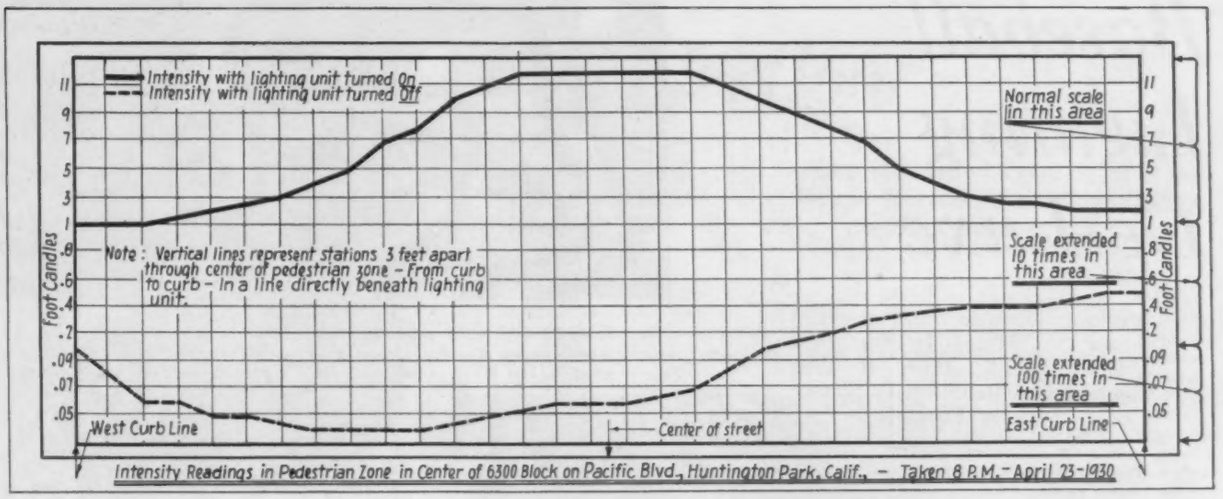

Intensity with lighting unit turned On
Intensity with lighting unit turned Off
Note: Vertical lines represent stations 3 feet apart through center of pedestrian zone – From curb to curb – in a line directly beneath lighting unit.
Foot Candles
Normal scale in this area
Scale extended 10 times in this area
Scale extended 100 times in this area
West Curb Line
Center of street
East Curb Line
Intensity Readings in Pedestrian Zone in Center of 6300 Block on Pacific Blvd., Huntington Park, Calif. – Taken 8 P.M. – April 23-1930

Chart showing various intensities with and without overhead unit

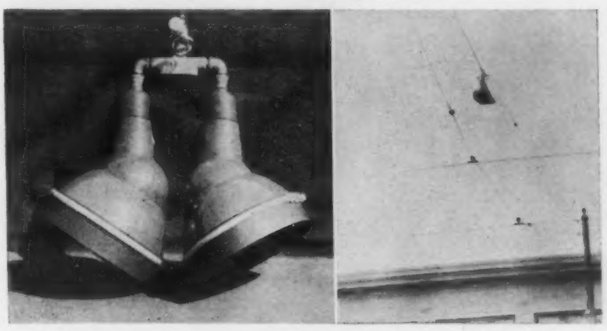
Safety Zone Lighting

HAZARDS for the golfer are numerous, but more numerous still are the hazards for the pedestrian at street crossings and so-called safety zones. Pedestrian crossings in the center of a block are especially dangerous spots for a citizen on foot because no corner lights are near and motorists often fail to see a pedestrian unless he is directly in front of the automobile headlights.

Al Anix, lighting engineer of the Southern California Edison Company, Ltd., and Tom McDonnough, factory representative of the Benjamin Electric Company, have developed a novel lighting arrangement for a middle-of-the-block crossing in Huntington Park, Calif. This zone, on Pacific Blvd., between Irvington and Clarington Sts., had been the scene of many disasters; in fact just before the city officials called the two lighting specialists into consultation, two traffic officers had been run down by motorists who had not seen them until too late to avert accident.

In spite of the fact that Pacific Blvd. is a comparatively brightly lighted thoroughfare with a modern installation of ornamental lighting standards, there was nothing to make the pedestrian stand out clearly above the prevailing level of illumination up and down the street. Contrast was needed and contrast was entirely lacking.

On the left, the reflector unit as it appeared before erection and, right, as it appears over the street



The solution as developed by the two men consisted of two Benjamin angle reflectors mounted back to back on a standard crossarm fitting and suspended above the center of the street, directly over the pedestrian crossing, with one reflector facing each curb. Lamps of 1,000 watts were used and each reflector was equipped with a special louver to confine the light to the limits of the safety zone. The louvers were constructed of galvanized iron rings with 12 ribs 2½ in. deep and 1⅛ in. apart. The ribs were parallel to each other and perpendicular to the rim.

The fixture is suspended on a messenger cable stretched between the ornamental poles on each side of the street. It is approximately 25 ft. high and, being over the center of the street, provides maximum illumination at that important point without danger of glare into pedestrians' eyes because of the high angle with regard to the lower levels. The illumination in the zone now runs from 2 to 12 foot-candles, whereas previous tests showed an illumination range of from less than .1 to .5 foot-candles.

The installation at first was an experiment, but the safety of this particular crossing has been so enhanced that the work has met with a high degree of favor. Otto Benedict, mayor of Huntington Park, and other city officials are now obtaining figures for five additional installations. This unit, say the engineers, is well adapted for street crossing safety lanes fronting theaters, churches, and schools, as well as the aforementioned application on a heavily traveled boulevard.

▼ ▼ ▼

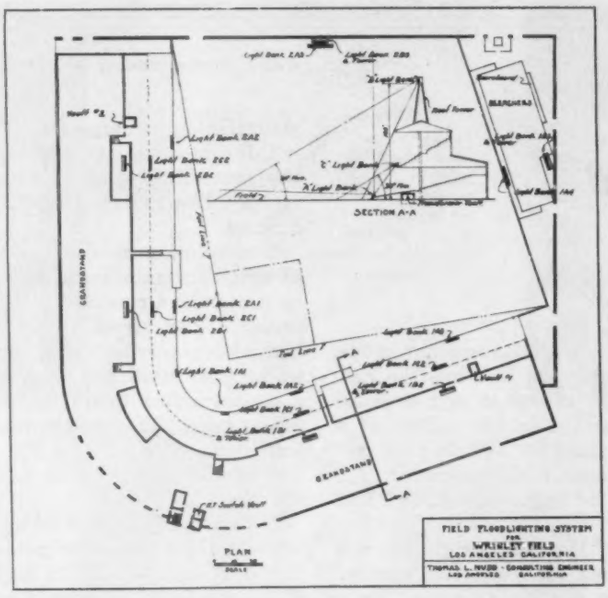
"THE LIGHTING BOOK," published by Curtis Lighting Inc., has recently come from the presses and been sent to architects, libraries, and universities throughout the country. With innumerable pictures, the book tells the story of lighting and its progress from stone lamps used 80,000 years B. C. Its 316 pages are filled with new and unique lighting ideas. It is a book invaluable to architects and illuminating engineers and contractors, and should repay in sales and installation ideas many times the hours spent in reading its contents.

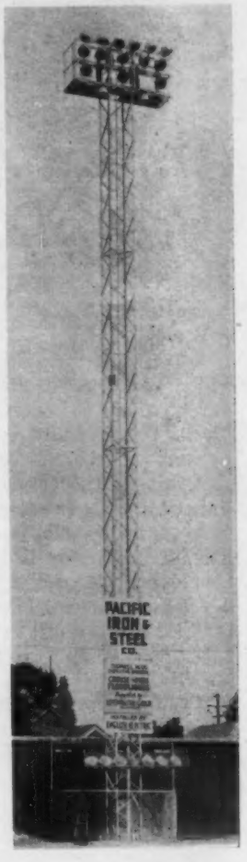
Baseball Lighting De Luxe

William Wrigley Told the Engineer to Make It the Best Lighted Field. How It Was Planned and Installed Is Shown Here in Pictures

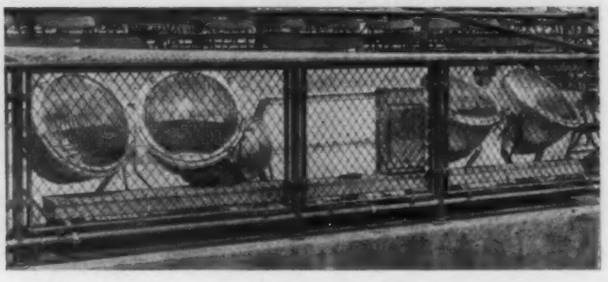
Only 22 days were required to install at Wrigley Field, home of the Los Angeles baseball team, a night illumination system second to none in the West. Contracts were approved on July 1 and the first game was played between Sacramento and Los Angeles on July 22

Plans were engineered as shown on the right, employing 156 Crouse-Hinds reflectors. The disposition of the units differs from that of any other Pacific Coast installation. Three tiers of units, one on the lower part of the grandstand, one before the balcony, and one on a 40-ft. standard atop the roof, illuminate the field from the front. A cross-section of this scheme may be seen below. The upper bank contains sixteen 20-in. units with 1,500-watt lamps. The lower tiers each have four. Installation was made by the English Electric Company under the supervision of Thomas L. Nudd, illuminating engineer, who designed the entire job





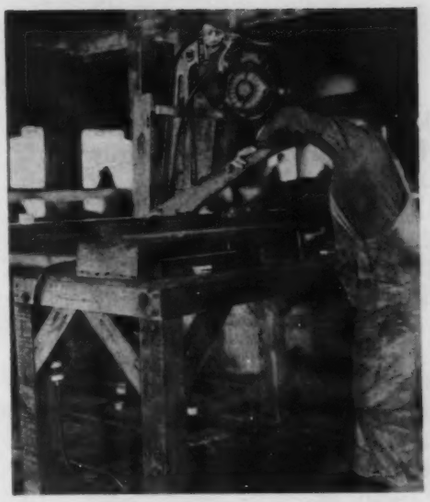
To the right may be seen one of the two 120-ft. steel towers in the outfields. The towers each support 18 units on top and 7 units at fence level. Unusual tilting angles produce an intensity of from 19 foot-candles in the outfield to 55 foot-candles between the pitcher and home plate. Below are the four reflectors seen at the base of the grandstand in the illustration to the left. Note the angular directions. (Photos courtesy Listenwalter & Gough, Inc.)



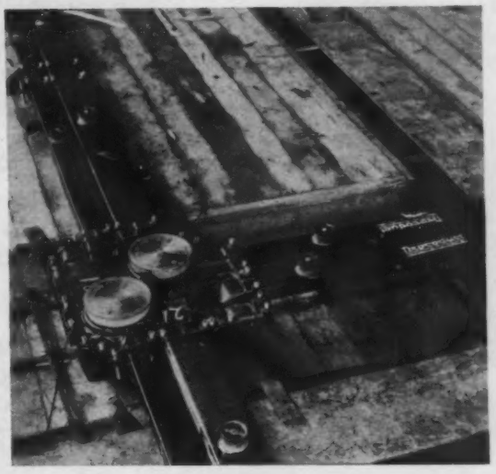
Underfloor Duct

Some Steps in the Organization of the Work of Installing Steel Raceways in the Shell Building Floors

First steps in the installation of the steel underfloor duct system for the Shell Oil Building, San Francisco, were taken in the yard of the electrical contractor, Charles A. Langlais, according to Frank Lynn, who superintended the installation. All outlet boxes and fittings were thus completely assembled in the yard, numbered, marked with arrows showing relation of the box to north or east, and delivered by floors. By this means the duct was always four floors ahead of the pour and a rate of eight floors a week was easily accomplished.

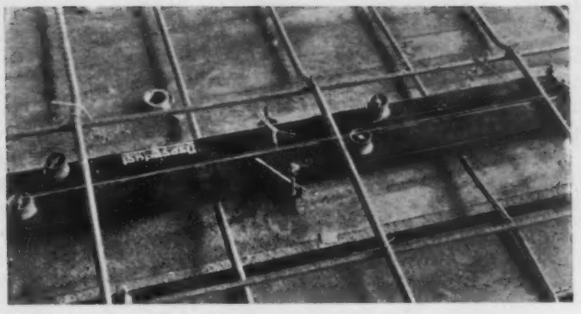


ABOVE: *Lengths of duct were cut by means of a power carborundum saw which made smooth, polished, accurate cuts*



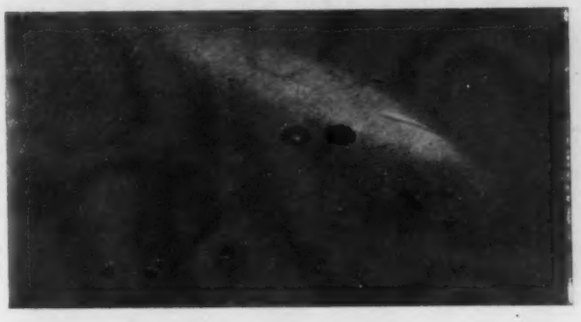
RIGHT: *A junction box leveled and anchored in place to the floor form. A depression in the floor slab was allowed at each box. Home runs were tapped to the bottom of the box. Below are shown home run conduits coming through the slab from a box and running to panel locations*

BELOW: *Runs of duct were set to an established line and leveled by means of screws in the supporting stirrup*



RIGHT: *Taps, by means of conduit, to the sides of the boxes, running to switch or panel locations*

BELOW: *Finished floor showing box covers and outlet nipples located through the concrete at established distances from the boxes*



Industrial

New Standards for Enclosed Switches

By R. J. LARRABEE

Assistant Electrical Engineer, Underwriters' Laboratories, San Francisco

"FOR A.C. Induction Type Motor Circuits Inspection Departments Should Approve Only Listed Enclosed Switches Having Horsepower Rating," Ruled the Southwestern Section, I.A.E.I. Comment Necessitated Interpretation of the Ruling, Which Was Made to Prevent Accidents and Applies Only to Enclosed Switches. This Article Explains the Underwriters' Laboratories Procedure in Testing.

INSPECTION Departments, in California at Least, Have Delayed Enforcement of This Requirement Until January 1, 1931, to Allow More Manufacturers to Redesign 440-Volt Enclosed Switches Which Will Stand Up Under the Tests and Hence Meet the Standards.

FOR the past eight years Underwriters' Laboratories have been testing enclosed switches manufactured on the Pacific Coast at their testing station in San Francisco. In the earlier days and until May, 1929, practically all testing for enclosed switches was carried out on direct current circuits under 50 per cent overload at rated voltage, and an endurance test of from 1,000 to 6,000 operations with rated current and voltage in sizes from 600 to 30 amp. with an additional number of operations without a load to determine the mechanical and electrical durability of the switch in question. The tests consisted of opening and closing a non-inductive circuit under the conditions first mentioned.

This earlier testing with direct current and a non-inductive load was reasonably satisfactory, as for the most part the enclosed switches in use controlled non-inductive circuits, and under these conditions, tests were much more severe than those made on alternating current. A.c. motors, however, became more and more widely used, and at the same time enclosed switches began to replace the more expensive oil switches which were originally used for motor control. Under these changed conditions, it was found that the field experience with enclosed switches was not so favorable at it should have been, so experimental tests were made to determine the cause.

At first the failure of motor control switches was attributed to the excessively high current taken by these motors when starting, but it was found that even switches having a current rating equal to that of the higher current would fail when tested with a motor, the characteristics of a.c. circuits being such that the simple methods employed for testing d.c. switches do not suitably represent the conditions of service for alternating current. For use with a.c. motors, switches may be required to open circuits carrying heavy currents of low power factor and high inductances. A theoretical study and practical tests indicated that these inductive circuits were many times more difficult to interrupt than those of unity power factor.

The proposal that such switches should be tested under conditions typical of service by the use of motors of suitable size having standard characteristics is not practical in a laboratory, as motors would be required for several voltages in all sizes and of various types differing widely in operating characteristics. For these reasons, it was considered desirable that facilities be provided for making tests of a.c. switches on inductive loads without the use of motors.

Therefore, during the years 1928 and 1929, Underwriters' Laboratories provided test equipment in Chicago and New York for testing enclosed switches at power factors from 35 to 85 per cent in ratings up to 400 amp., at 115 and 230 volts, and up to 200 amp. at 460 and 575 volts. The equipment is also designed to be suitable for testing a.c. motor controllers up to 50 hp. at 550, 440, and 220 volts, and 30 hp. at 110 volts. Facilities in the field are available for testing up to 600 amp, 575 volts, at the power factors mentioned.

In testing enclosed switches, the switch is mounted on the wooden bars of the test panel so that the case is insulated from any grounded metal. Connections to the line and load terminals of the switch are made as intended. The enclosure is connected through a low rated fuse to the line terminal considered least likely to arc to the enclosure. For operating the switch, a rope and pulleys are used to enable the tester to operate the switch at a safe distance and to insulate him from the enclosing case. Insulated wooden poles and other means of extended insulated operating handles may be used.

A circuit is made and interrupted by closing and opening the switch at a rate which depends upon the current rating of the switch. Fifty complete operations are made in the overload test. Failure on this test is indicated by the blowing of fuses connected between the enclosure and one of the line terminals, or opening of an oil circuit connected in the supply line. These indications are frequently accompanied by heavy arcing inside of the case with the usual external indications of such a condition.

By adjustment of the resistance and inductances, the required test load and power factor are obtained, each of the load units having the same adjustments made to preserve a balanced load in all three phases.

Three-phase power is most often used since the performance of the two-wire switches for single phase, and of four- and five-wire switches for two-phase, is adequately indicated by the performance of the three-wire three-phase switch test.

To prevent damage to equipment and excessive damage to the switch under test, time delay overload relays are connected in the supply line to open the oil circuit breaker if the switch fails by arcing across phases while being operated to interrupt the circuit.

Endurance tests are conducted in much the same manner as the overload tests, the rate of operation being the same but the number of total operations being much greater.

Testing of enclosed switches on the Pacific Coast is being carried on in co-operation with the Bureau of Tests, Pacific Gas and Electric Company, at Emeryville, Calif., where facilities are provided under the direction of A. O. Knopp, chief engineer, and L. G. Hill, engineer, for duplicating the above described characteristics.

The test circuit is serviced from a 600-amp., 12,500-volt, three-phase circuit passing through the necessary protective oil switches and relays to a bank of three-phase transformers, where the voltage is reduced to the necessary 460 and 575 volts for test purposes. The testing is done in the open, the load being obtained by means of air core inductances constructed of coils of weather-proof wire and a constant current water box. The current dissipation in the water box is held practically constant by means of a water balancing centrifugal pump adjusting the supply of water with temperature change. One water box and inductance coil is in each side of the test circuit. The necessary controls, motors, and recording instruments are mounted at an advantageous point so that the control of the entire test circuit is centralized.

It is not deemed advisable, due to the exceedingly uncertain performances of switches under test, to conduct tests under this method with a personnel of less than three men, one man being necessary to operate the switch under test, the second man to control the power supplied to the circuit, and the third to act as a safety man. He has available for his operation a duplicate set of controls regularly handled by the second man mentioned. The safety man is also stationed at a point where he may have an unobstructed view of all proceedings and at the same time be at a point outside the zone of possible disturbance.

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Motor Break-Down Caused by Iron Dust in Insulation

A TOTALLY enclosed, ventilated motor generally is looked upon as being self-protected from dust and dirt troubles. However, a recent report concerning a 20-hp. enclosed air-circulating motor in an industrial plant proves the contrary to be true.

Serious brush sparkings and an occasional flashover which did not yield to the usual remedial treatments resulted in an investigation which disclosed a relatively large amount of steel and iron dust that had settled upon the field poles of the motor. This dust had been collected from the ventilating air by the attraction of the magnetic field and the result of its presence on the pole pieces was to produce an unbalanced magnetic field which, of course, resulted in poor operation.

A thorough overhauling and cleaning accomplished the desired results in restoring the motor to satisfactory operation. To prevent a recurrence of the trouble, a fine gauze filter removed the larger particles and the bar magnets collected the smaller particles which passed the filter, preventing them from going on into the motor.

A weekly cleaning of magnets and filter was found to be sufficient and the whole arrangement serves most efficiently to prevent the magnetic particles from getting into the machine.

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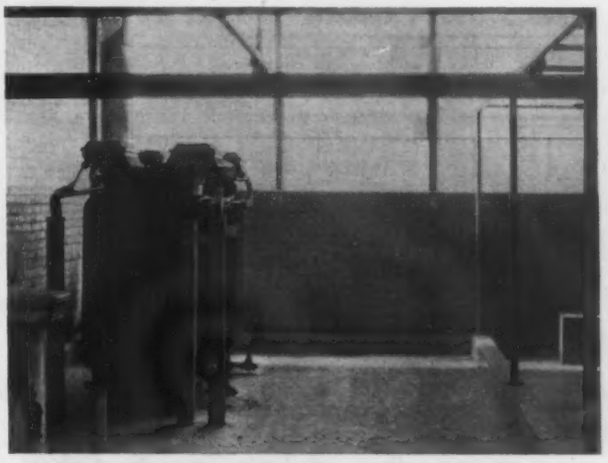
Bare Buses Feed Electric Furnaces

AMPLE transformer and switchboard combination room with an unusual application of bare bus distribution, was that employed in the wiring of the Byron-Jackson Pump Company, Los Angeles, by the Quality Electric Works of Los Angeles. As will be seen in the illustration, the transformers are set inside a concrete curbed area. The power feeders go underground from the transformers to the switchboard and to the service of the power company.



Concrete curbs line transformer space in Byron-Jackson Pump Company, Los Angeles. The unusual application of bare bus distribution in the same plant is interesting

The heaviest load in the plant is that of a series of electric furnaces for heat treating of metal parts. To serve these furnaces, three heavy copper busbars are hung from the rear of the switchboard by means of insulated bus hangers suspended from piping. These buses go through an aperture in the brick wall directly connecting with the electric furnaces on the other side of the wall. The entire transformer and switchboard is enclosed and is ample enough for future additions if required.

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Designs Special "Shaker"

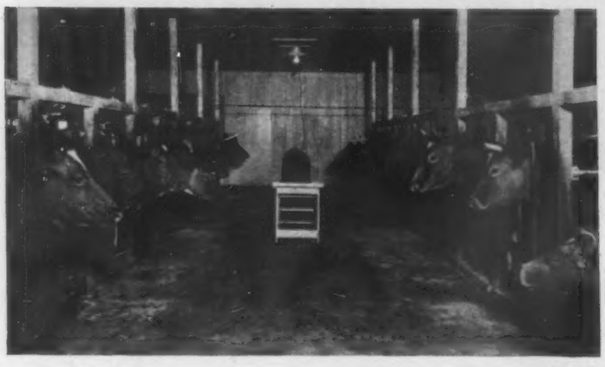
FOR a shaking rig used at the plant of the Clearwater Lime Products Company at Orofino, Idaho, "Mac the Motor Man," of Spokane, Wash., recently built a 15-cycle generator. An old 10-hp. motor was used for the job. When completed it operated direct-connected to a 10-hp. motor and produced 5 kw. at 110 volts, 15 cycles. The machine was a two-pole 860-r.p.m. generator.

Radio Becomes a Milkmaid

Not Only Radio, but Other Appliances Have Been Given New Uses by These Enterprising Washington Dairymen.

By J. C. Scott
Agricultural Specialist, Puget Sound Power & Light Company

WHAT kind of radio music does your cow like? Sounds silly, but the Dodd brothers, owners of the Marymoor Dairy, near Highland, Wash., are firm believers in the future of radio as a help in dairying. When the cows are brought into the milking sheds, a small radio is turned on. "We notice that the cows like the soft music of the radio," comments Ralph Dodd. "It quiets them; they become less nervous and, with most of the heavy producers, the milk will begin to drop soon after the radio starts."



A small radio which has outlived its household usefulness is a real help in the milk shed, these dairymen have learned

The relaxation induced by the radio music not only makes a more contented cow, but it has resulted in an increased flow and a better quality of milk.

Use of the radio at milking time is indicative of the thoroughness and the extent to which dairymen will go to get a better product. Every possible job is accomplised by electricity at this farm and many newly developed electrical devices are being used here for the first time.

Having a clean, washed barn in which to milk is only one precaution taken to keep the dust out of the milk. Before milking, the udders are washed and the cows curried with an electric animal groomer which works on the same principle as a household vacuum cleaner.

An electric milking machine is used to milk the cows. The product is not exposed to the air in this operation, as it goes from the teats into a cup and through a rubber hose into an inclosed container. But pure milk is not the only advantage in using such a machine.

"We figure," explains Mr. Dodd, "that the milking machine operated by a ¼-hp. motor saves us five man-hours a day over the old hand-milking method. It doesn't tire us out so much, either."

Vacuum cleaning cows is a new art, in keeping with the sanitary trend of modern dairies. A small hand model is used for this task

After the first operation, the warm milk is taken to an electric milk cooler where its temperature is reduced immediately to 40 deg. F., which checks the growth of any bacteria which may be in it. The milk is then stored in a 5 x 6 x 8-ft. refrigeration box until delivery. This electric refrigeration plant is also equipped to manufacture ice, so that when the milk is delivered on trucks, the bottles are packed in ice.

Flies are kept out of the milk house by insect electrocutor screens.

Other duties and operations in the preparation of certified milk and other high-grade dairy products are left to electrical equipment, too. To keep the bacteria count low in milk, every utensil in which it is handled must be thoroughly sterilized. At this dairy, a 30-gal. water tank with a 750-watt electric heater is insulated so that no heat is lost and hot water is available at any time of day or night.

After the hot water tank and sterilizer were put into use, the Dodd brothers decided on still further precautions to insure that no bugs, microbes, or bacteria were left around the milk house. They installed live steam under high pressure.

An electrically-heated steam pressure boiler suitable for their purpose could not be found on the market, so the farm electrification service of the Puget Sound Power & Light Company, co-operating with Hindman & Shipp, of Seattle, developed a new idea in electric steam boilers which, say the brothers, is giving absolute satisfaction.

"We have used every kind of water heater and dairy sterilizer on the market," said Lloyd Dodd recently, "but this electrical equipment is far more satisfactory in every way than anything else we have ever used."

Such apparatus is essential for the economical production of certified milk containing only 1,000 to 4,000 bacteria per cubic centimeter.

When a surplus of skimmed milk is left, it is made into cottage cheese by heating 50 gal. of it to a temperature of 70 deg. F., and holding it there for about 12 hours by means of an automatically controlled electric heater. When ready, the curd is cut, the whey drained off, and the temperature of the cheese immediately

raised to 140 deg. F. It is kept at this temperature about half an hour, or until the right solidity has been obtained. Marymoor has probably the first electric cottage cheese machine ever made.

Electric milking machines are the real time-savers of this industry. Nearly every electrical appliance has found some use at Marymoor

To the uninformed it would seem that the electric bill at Marymoor would be prohibitive, because many other jobs, such as washing bottles, pumping water, household work and cooking are also accomplished by electricity. But the owners of Marymoor say, "Though we could well afford to pay $75 a month for our electric service, the monthly bills run close to $30."

Sterilization of utensils and the manufacture of cottage cheese is the job of these special steam pressure boilers. Regulated heat makes Marymoor the home of the first electric-made cottage cheese

Ordinary Lathe Made Doubly Useful

ANOTHER form of winding method used for banding armatures, winding coils, etc., used effectively by the California Electric Works of San Diego, employs an ordinary lathe. This lathe is mounted at one side of a line directly under the overhead traveling crane so that the armatures, etc., may be swung into it without lifting by hand. In the photograph an autotransformer form is being held in the four-jaw chuck on which is being wound one of the coils. Winding is done from the back of the lathe, the wire running over the top and away from the operator. Winding is done from this side so that the chuck or face plate will not unscrew but will tighten against the action of the lathe.

Starting and stopping is done by a foot button controlling a magnetic switch. This leaves both hands free for the winding. Armatures are also banded in the same manner.

This lathe is used for winding coils, banding armatures, and other jobs

The head stock is lined up with a wire tension rack as is the regular coil winder used in the shop. This tension rack holds six spools and makes it possible to use both the lathe and the coil winder at the same time. It will be noted also that the motor is applied directly to the machine itself, doing away with overhead shafting and pulleys.

The biggest job done on this machine was a 660-hp. General Electric autostarter having three coils, one on each leg. A drum operated reversing switch is mounted on the other side of the lathe and used for all machine work. This lathe is considered one of the most valuable machines in the shop.

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A LIST of over 300 applications of fractional horsepower motors has been compiled by the Electrical Division of the Bureau of Foreign and Domestic Commerce from lists received through the courtesy of various motor manufacturers. This survey was undertaken by the Electrical Division, following the request for suggestions for new outlets for such motors. Copies of the composite list are available from the Electrical Division without charge.

Synchronized Power Drives Truck and Trailer

AN ELECTRICALLY operated truck and trailer, with power units in both vehicles controlled by one driver, is now hauling a daily load of 22 tons of milk products between Long Beach and San Pedro, Calif., for the Golden State Milk Products Company, a large dairy organization. The unit was entirely designed and built in the automotive shops of the company in Los Angeles.

These electric delivery trucks may be driven from either side

So far as is known, this is the first time a powered trailer has been used. At least it was not to be found in the ordinary classification books of the California Motor Vehicle Department, and a special license had to be issued for the operation of the unit on the highways.

The idea first originated with M. J. Thiebaud, manager of the L. A. Automotive Works, which is owned by the Golden State company. Plans for the combination job were completed and construction was started in May, 1930. The work was completed and the unit began operating on regular schedule in July, making the round trip of 25 miles per day from Long Beach to San Pedro, hauling milk and other dairy products between two of the milk plants. All of the hauling is done at night and all signs on the vehicle are electrically lighted.

Both the truck and the trailer are six-wheel units. Although the bodies were specially built, the chassis for the two came from two old Walker Electric trucks which had seen service in the ice cream department of the Golden State company for eight and ten years respectively. Power is applied to both rear axles of the truck and to the front rear axle of the trailer, thereby making it a six-wheel drive unit.

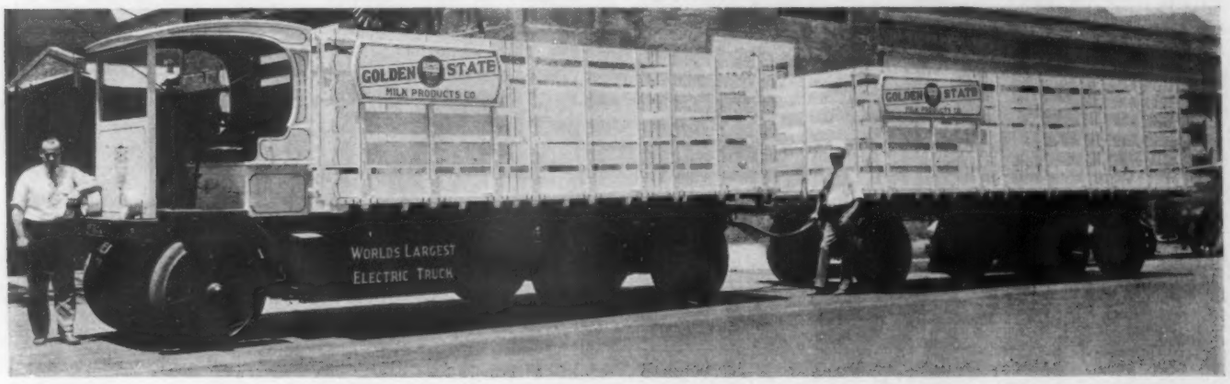
A unique feature of the tandem vehicle is that old batteries which have seen eight to ten years of service in milk delivery trucks are used for the power plant. They are charged at the end of each round trip in the company's plant at Long Beach. Storage space for the batteries in the truck, which consist of 120 cells composed of 6-cell Edison units, is under the body of the truck. In the trailer the battery box contains 120 cells of 8-cell Edison units. It is installed on the floor of the trailer at the front.

The motors used, from the old Walker electrics, are rated at 90 amp. and 60 volts each. A standard controller system is used, with two controller boxes so placed that they are operated by one lever. A speed of twelve miles per hour is attained.

Other details of the construction are four-wheel mechanical service brakes, and an electric four-wheel brake system. The brakes are on the truck body only. The length of the truck is 22 ft.; the length of the trailer is 20 ft. and the over-all length of the two units is 50 ft. The walking-beam type of spring suspension is used.

In addition to the construction and synchronization of the two electrically propelled vehicles, Mr. Thiebaud has designed a low-step, center drive electric truck of light weight for retail milk delivery service. More than forty of the new type retail milk delivery electrics have been built by the L. A. Automotive Works for the Golden State company. Old Walker electric milk delivery trucks were cut down and rebuilt to make these new vehicles.

Both truck and trailer are powered and control is sychronized to give driver absolute control. This electric truck was made in company shops from an old Walker



Lifting Sewage To Sea Level

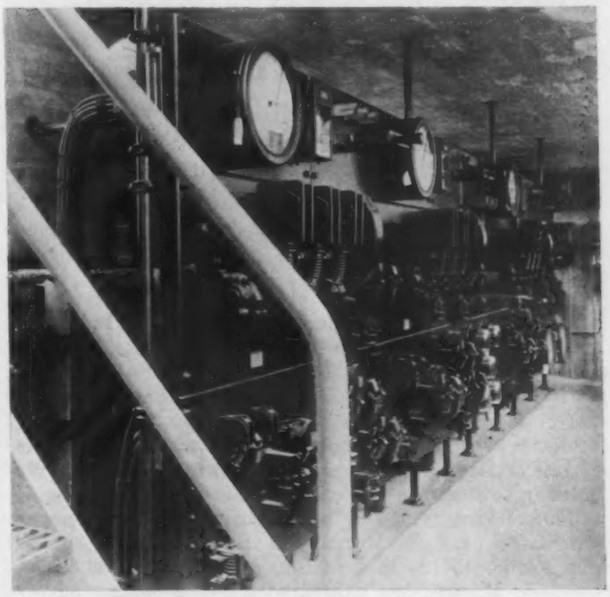
High Water in the River Makes Necessary a Large Pump Installation to Drain Storm Sewers Over the Sea Wall

PORTLAND'S municipal sewage pumping plant of 110,000-g.p.m. capacity was completed in 1929 as part of the city's sea-wall project. It was designed to pump the drainage at times of high water in the Willamette River from an intercepting sewer running behind the sea-wall for about one mile along Front St. The interesting pumping and electrical installation in the plant was made by Jaggar-Sroufe Company, electrical contractors of Portland.

Five pumps, two of which are of 10,000-g.p.m. capacity driven by 100-hp. motors, and three of 30,000-g.p.m. capacity driven by 250-hp. motors, are housed in this plant. These pumps, automatically controlled by float switches, are set to come on successively as sewage and drainage rises in the intercepting sewer outlets. The smaller pumps are by Fairbanks-Morse and the larger ones are of American Well Works make, all of the trash-pump type. The smaller ones will pass solids up to 15 in. in diameter and the larger ones up to 24 in. There is a swinging gate valve at the outlet to each pump and a manually operated valve in addition.

Westinghouse motors serve the three large pumps and Fairbanks-Morse motors the two smaller ones. All motors are wound rotor type with high secondary resistance at the starting point, automatically cut out by steps as the motor comes up to speed. They are specially designed with extra insulation for operation in dampness.

The electrical features in the building are interesting from the standpoint of providing automatic control and continuous operation. Two primary circuits of 11,000 volts are brought to the building from two paralleling feeders tying in the two most important substations of the Pacific Northwest Public Service Company, so that the failure of one of these feeders or one of the stations



Mounted on the switchboard are five curve drawing flow meters. Control of plant is automatic through float switches which bring in pumps successively as water rises in sewer

cannot put the pumping station out. Both primary services are provided with relays to cut over automatically in case of the failure of either one.

Secondary service at 440 volts is supplied to the motors through two 450-kva., 3-phase, 11,000/440-volt, star-delta transformers, connected in multiple on the secondary bus, so that the failure of one will still permit operation of one-half the pumping load. A separate 440-volt service is run to the building to operate the crane, sump pumps, and other station service when the large pumps are not in service. A separate lighting service likewise is provided.

Twenty-six lateral sewers draining an area of 426 acres terminate in the intercepting sewer. At low water stages of the river the intercepting sewer drains into the river by gravity, the outlet by-passing the pump-house. When the water in the river rises above the gravity outlet, the gate is closed manually and the pumping plant is placed in operation with the desired settings established on the float switches. The maximum head against which the plant operates is 22 ft., the height of the sea-wall above the gravity outlet.

Heretofore, drainage of the lateral sewers into the river was stopped by high water, and seepage and back drainage through basement drains in buildings along the lower streets created an unsanitary condition, and made individual pumping necessary. The new intercepting sewer and pumping plant will clear this condi-

In the foreground of the pumping room are two of the 30,000 g. p. m. pumps, with two 10,000 g. p. m. units in the background. Another of the larger pumps is elsewhere in the plant

tion and make unnecessary any individual pumping at any stage of the river below El. 32.5, the height of the sea-wall.

The sea-wall and sewer project represents the first phase of the water front development designed by O. Laurgaard, city engineer. C. W. Lundell, electrical engineer for the city, supervised the construction of the pumping plant.

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Small Advertisements Which Beget Results

How One Electrical Dealer Has Made a Small Appropriation Bring the Results Usually Attained Only by Larger Outlays

HOW to obtain results from single-column advertisements in newspapers is one of the acute merchandising problems of the electrical dealer who cannot justify the appropriation necessary for the use of larger space. Whether to run a larger number of small advertisements or a smaller number of large advertisements is but one of the problems; more important is how to write the copy so that the readers will become customers.

"Human interest copy" has entered the newspaper advertising of J. B. Morgan, 41 East Green St., Pasadena, Calif. With this factor, and mechanically good copy, Mr. Morgan has gained with single-column advertisements the results of two or more column advertisements and with the consequent saving in cost. The increase in prestige of the firm and the numerous comments have convinced J. T. Bryne, advertising manager, that his advertising is being read extensively.

"We are firm believers in a slogan with alliteration, rhythm, rime, and the mechanics to make it stick in the mind," he says. "So we adopted 'Motor to Morgan' as a slogan and use it in a border around the entire one-column advertisements, repeating it at top, bottom, and sides. We feel that the persistence and attractiveness of the slogan and ads have implanted our name firmly in the minds of the readers.

"We insist upon plenty of white space around the margin and set the copy almost in 'free verse' form. Because of this, a Morgan advertisement can be seen in the midst of a page of others.

"Most of the advertising copy is what might be termed 'human interest copy.' This is hard to define, but at any rate it means copy which is written in a more or less sprightly conversational tone, and discusses a commonplace thing which is frequently in the mind of the reader. It unquestionably makes its greatest appeal to the women folks. This is probably because the woman of the house is more intimately interested in proper wiring than anyone else. She is the person using the appliances and knows the difficulties.

"Occasionally we have used what we call a 'reason-why' advertisement. In such copy we tell the reason for using Morgan service, usually playing it up in the heading, not forgetting, however, to use a little alliteration there also. We do this partly to vary the program and partly to give a little special emphasis to our quality of service. It creates a desire as a result of the interest maintained and gathered by the human interest copy."

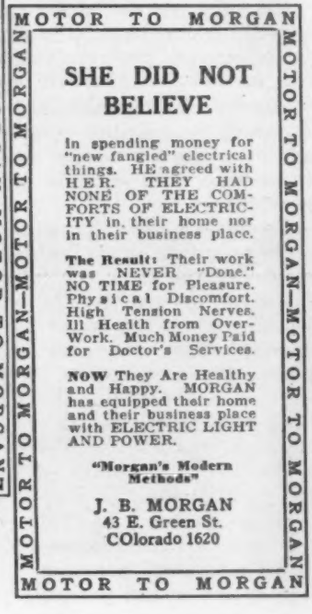
A study of some of the Morgan advertisements reproduced on this page may provide some useful advertising tips.

▼

MOTOR TO MORGAN
MOTOR TO MORGAN—MOTOR TO MORGAN
Convenience, Comfort, Cost
Convenience wonderful. Comfort complete. Cost important but not the most important feature. We are speaking of electrical devices.
If Morgan does your electric wiring, or electrical construction, or installs your electric motors, convenience and comfort will be yours. Cost will be low.
Morgan's way means the absence of repairs and annoyances. No premature extra expenses.
"If it is anything electrical,
No matter what it be,
See Morgan, Green St., Number Forty-three."
Have it done by "Morgan's Modern Methods"
J. B. MORGAN
43 E. Green St.
COlorado 1620
MOTOR TO MORGAN—MOTOR TO MORGAN—MOTOR TO MORGAN—MOTOR TO MORGAN
MOTOR TO MORGAN

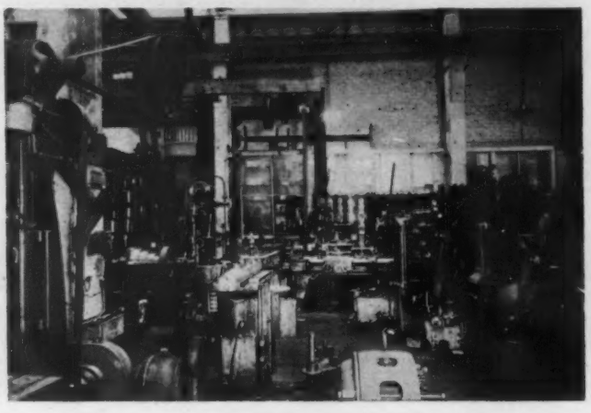
"Reason—Why"

"Human Interest"


MOTOR TO MORGAN
MOTOR TO MORGAN—MOTOR TO MORGAN—MOTOR TO MORGAN—MOTOR TO MORGAN
SHE DID NOT BELIEVE
In spending money for "new fangled" electrical things. HE agreed with HER. THEY HAD NONE OF THE COMFORTS OF ELECTRICITY in their home nor in their business place.
The Result: Their work was NEVER "Done." NO TIME for Pleasure. Physical Discomfort. High Tension Nerves. Ill Health from Over-Work. Much Money Paid for Doctor's Services.
NOW They Are Healthy and Happy. MORGAN has equipped their home and their business place with ELECTRIC LIGHT AND POWER.
"Morgan's Modern Methods"
J. B. MORGAN
43 E. Green St.
COlorado 1620
MOTOR TO MORGAN

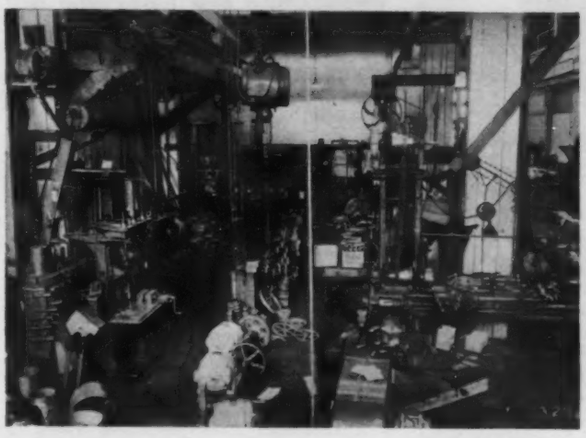
When a Motor Shop Is a Machine Shop

MORE than a motor shop is the Farnsworth Electrical Works at San Francisco. The equipment here, developed over a long period, is as much that of a machine shop as of a motor shop. While primarily machine shop equipment is used for the manufacture of detachable hub pulleys, an invention of Horace Adams, president and manager, it finds frequent use in adapting motor drive to machinery of all kinds.



Some of the equipment in the photograph preceding and its uses are described by Mr. Adams about as follows: The hydraulic wheel press, shown at the extreme right, for example, is very useful in pressing shafts in and out of armatures and rotors. This heavy machine exerts 80 tons pressure. Much work of this kind is done for other shops in the city by this company. At the rear is seen a storage rack for the cast iron pulleys and hubs. In the foreground, near center, is shown a shaper and at the extreme left a radial drill. Immediately behind it is a 24-in. lathe and at the extreme rear a small key seater. All tools are individually motor driven.

Another view of the shop (below) shows at right a 14-in. lathe, immediately behind it a tapping machine made from a drill press, other lathes previously described, and at left a three-spindle drill press. A 21-in. turret lathe is at left, rear, and in the foreground on



the floor are back-geared motor bases under construction and two ventilating blowers to which motors are being mounted. Two cranes are in use in this plant, one a six-ton crane along the main bay, the other a one-ton crane over the machine shop bay.

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Advertises Its Buying

A new slant in the advertising of a motor firm was given in the Christmas number of *Industrial Electric News*, the house advertising organ of the Pacific Electric Motor Company, Oakland. As it reviewed the year's activities it called attention to the fact that it was a large buyer of supplies and materials from local concerns and was a "good customer of East Bay concerns." "In 1930," it concludes, "we shall continue our policy of reciprocation, believing that our customers are entitled to the lion's share of our business when we buy."

▼

SUMMER RESORT INVITES APPLIANCES—Sooner or later it had to come. It remained, however, for Dreyer's Cabins at Guerneville on the Russian River to make a feature and sales appeal out of electric equipment in their summer resort accommodations. Not only in the folder published by this resort but in its newspaper and other advertising it makes a feature of the fact that each cabin is equipped with an electric stove. "Electric Stoves Are Installed in Each Cabin," the pamphlet states. "All cabins are wired for electric appliances. You may bring your electric curling iron, toaster, percolator, radio, etc., thereby enjoying your vacation with all the comforts of home."

Desert Ranch Electrified

ONE of five similar pumping plants on the ranch development of King G. Gillette, son of the famous razor king, at Palm Springs, Coachella Valley, Calif. The pumping plant consists of three 60-hp. pumps, one 30-hp. pump, and one 20-hp. pump. The cottage shown in the illustration is one of seven for ranch employees. Each is equipped with electrical refrigerator, water heater, range, and air heaters.

Grapefruit is being planted on the 480 acres under development.

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Interpretation to Clear Up Motor Rule

George E. Kimball, electrical engineer for the State of California, Department of Industrial Relations, Division of Industrial Accidents and Safety, has issued a ruling with respect to electrical safety order No. 711-9(a). His statement is as follows:

MOTOR CIRCUIT CONTROLS

The question frequently comes up regarding circuits for automatic motor starting devices where the control circuit is supplied from a separate circuit and sometimes from a different system from the power for the motor.

For example, a starting device for a 440-volt motor may be operated from a control circuit which is energized by a 110-volt lighting circuit connected to a thermostat relay, mercury switch or other device. In such cases the 110-volt circuit is carried into the contactor panel with the higher voltage where it is connected to coils and contactors for starting and stopping the motor. There is danger of accidental cross connections between the power and lighting systems if the control circuits are not de-energized when the motor circuit switch is opened.

To comply with the requirements of electrical safety order No. 711-9(a), the control circuit must be disconnected when the motor circuit switch is opened to disconnect the motor and starting device. The control circuit should not be supplied from the lighting circuit but should be energized through a small air-cooled transformer connected on the load side of the motor circuit switch where it will be disconnected when the switch is opened.

A transformer is required for each individual motor starting device and not more than the one control circuit should be taken from any one transformer.

News

Southern California Edison Company Promotes Five Executives

W. L. FROST

D. M. TROTT

B. F. FLUNO

BYRON T. STORY

W. C. McWHINNEY

PERSONNEL changes affecting five veterans in the organization of the Southern California Edison Company, Ltd., Los Angeles, have been announced by John B. Miller, chairman of the board of directors. The five men are W. L. Frost, general commercial manager, who has been elected vice-president of the company in charge of sales; D. M. Trott, comptroller, who has been elected vice-president in charge of finance; B. F. Fluno, assistant comptroller, who has been made comptroller; Byron T. Story, assistant treasurer, who has been made treasurer, and W. C. McWhinney, assistant general commercial manager, who has been appointed commercial manager, succeeding Mr. Frost and reporting to him.

Mr. Frost's career with the company began at Pasadena in 1900 as a groundman. He later was made agent at Redondo Beach and in 1906 became agent, or district manager, in Santa Ana. Two years later he was transferred to the Redlands office in the same capacity and in 1916 was appointed assistant general agent in the Los Angeles general offices. He was made assistant to the vice-president in 1920, holding this office until his appointment as general commercial manager in 1926.

Mr. Trott has been a member of the company 25 years, having entered its employ as an accountant in 1905. He became a traveling auditor two years later and in 1912 became statistician. He was appointed assistant comptroller in 1917 and was advanced to the office of comptroller three years later.

Mr. Fluno, who succeeds Mr. Trott as comptroller, has been assistant comptroller of the company since Feb. 1, 1924. He entered the company's organization as a time-keeper Aug. 3, 1914, and two years later was appointed statistician. Early the following year he became a clerk in the accounting department, and on May 1, 1922, was made special accountant and tax agent in the comptroller's department. Two years later he was advanced to the post of assistant comptroller.

Like the other newly elected officers, Mr. Story is a veteran in the Edison organization, having been with the company and its predecessors 27 years. He entered the company as an accountant and became a traveling auditor on Jan. 1, 1907. In May, 1909, he was appointed manager of the Monrovia district and a year later became assistant auditor. He was appointed auditor on Jan. 1, 1912, and took the post of assistant treasurer on June 1, 1917.

Mr. McWhinney, who has been assistant general commercial manager of the company since July 1, 1926, has been with the company since Nov. 1, 1909, entering the service as a stock clerk in the stores department.

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Arizona Files Suit to Halt Dam Construction

Arizona's long-threatened suit to challenge the legality of the Boulder Canyon Project Act was approved by the United States Supreme Court on Oct. 13 when a bill of complaint directed against the other six Colorado basin states and the Secretary of the Interior was permitted to be filed. The defendants will be allowed until Jan. 5 to file their answers, after which it will be determined whether or not an injunction may properly be asked in the case.

In its bill of complaint, the State of Arizona contends that the project violates its rights for five reasons, one of them being that it attempts to discriminate against the State of Arizona in favor of the State of California by providing that the water to be stored in the reservoir shall be delivered without charge for use in the Imperial and Coachella Valleys of California, whereas water users in Arizona must pay prices set by the Secretary of the Interior.

When advised of the suit, Secretary Wilbur said construction work, recently begun, would continue until stopped by court order.

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Vernon (Calif.) Votes Bonds for City Power

At a recent special election in the City of Vernon, Calif., $3,900,000 in bonds were voted to construct a municipal power plant and distribution system. Vernon is an industrial city almost wholly surrounded by the City of Los Angeles. Of some 125 votes in the community, 67 were cast at the special election, 64 for and three against the bonds.

There is a total load of approximately 50,000 kw. in the city, and it is the avowed intention to serve this by Diesel engine driven generators.

Issues Affecting Electrical Industry to Be Voted on at November Polls

BRIEFLY summarized, issues of particular interest to the electrical industry to be voted on in Oregon, Washington, and California at the November elections are as follows:

OREGON

A measure known as "People's Water and Power Utility Districts Constitutional Amendment" would amend the constitution to provide for the creation of utility districts in territory contiguous or otherwise, within one or more counties, and which may include one or more incorporated municipalities. Such districts would be managed by a board of directors of five residents with extraordinary powers to levy taxes and to issue and sell bonds.

Proponents insist that the only reason for the submission of this measure, which has been brought before the people by initiative, is to give rural districts the same privileges now enjoyed by municipalities with respect to entering the power business. Opponents claim that such districts may now be provided for by the Legislature without recourse to specific constitutional authority. They point to the lack of limitations on the tax levying and bonding powers in the measure as a grave danger which might lead subdivisions of the state into an orgy of unwarranted spending.

WASHINGTON

In Washington the measure to be voted upon is Initiative to the Legislature No. 1, known as the "District Power Bill" and sponsored by the Washington State Grange. It is "An act relating to and authorizing the establishment of public utility districts, and the consolidation thereof and annexation thereto; providing for the construction, purchase, condemnation and purchase, acquisition, maintenance, conducting, operation, development and regulation by such districts of certain kinds of public utilities; providing methods of payment therefor; and providing for the creation of local assessment districts by, and defining, prescribing and regulating the powers, duties and government of, such utility districts."

The act gives broad powers to public utility districts with respect to irrigation, domestic water supply and hydroelectric power. These powers include the right to construct and operate water works, irrigation systems, and power plants, either steam or hydroelectric; to purchase or condemn lands within or without the limits of the district; to sell water or electrical energy within or without its limits and make its won regulations with respect thereto, free from any control by the department of public works; to issue general obligation or utility bonds; to levy an annual tax not exceeding 2 mills in any year, exclusive of interest and redemption of general obligation bonds.

The Grange contends that the powers contained in the bill have been on the statute books for years and have been approved by the courts, but that they apply only to incorporated cities, and that this bill will enable the smaller cities and towns also to take advantage of them.

Opponents of the bill point out the grave danger of the wide powers conferred by the measure. They argue that a power district in one county could take over power plants and distribution lines and irrigation systems in another county, thus exempting it from taxation, and do this without the consent and against the will of the county in which the property is located. They maintain that the application of the bill, if adopted, would remove additional millions of dollars of property from the taxroll.

CALIFORNIA

In San Francisco a charter amendment creating a public utilities commission will be submitted to the voters. This commission would consist of three members holding office for six years at salaries of $6,000 each, terms of office to be staggered, the first members to be appointed by the mayor, successors thereafter to be elected; a manager of utilities, who must be a Californian, to be appointed by the commission, which would have the power to make monthly appropriations for conducting all utilities. If the surplus in any year exceeds 25 per cent of operating expenses, it may revert to the general fund, at the option of the board of supervisors, but this is not compulsory.

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Authority Sought for Starting Klamath Project

Armed with over a score of petitions and other communications signed by southern Oregon citizens who approve of the development, and accompanied by a hundred representative taxpayers of the region, California Oregon Power Company officials appeared last month before the Reclamation Commission and submitted arguments in behalf of the utility's application for authority to proceed with the construction of the first unit of the $27,000,000 power projects along the Klamath River. The commission was informed that the utility consents to signing a waiver by which the operator agrees to guarantee that at all times the use of the water being applied for will be so controlled that no hazards will result to irrigation farmers. The company also agrees to begin construction within 24 hours after the application has been granted, and employ 800 to 1,500 men on the project for a period of not less than eighteen months.

It was argued by both the assistant attorney-general and counsel for the protestant Klamath Irrigation District that the waiver offered by the utility would not be legally binding. Testimony and evidence introduced during the hearing, however, tended to show that the company is operating under a contract with the government which contains a similar waiver, and that this relinquishment authorizes any federal agent to assume complete control of the utility's dam and regulate the flow of water at any time the irrigationists can establish that water shortage endangers their respective holdings. The commission has taken the applications and arguments under advisement.

In the meantime, L. A. Liljequist, deputy attorney-general of Oregon, has advised the State Reclamation Commission that it is without legal authority to grant the California Oregon Power Company a permit to appropriate water from Klamath River for power development purposes. The state's counsel holds that the commission can exercise no jurisdiction over the river in question for the following reasons: (1) The water of Klamath Lake, the actual source of the Klamath River, was ceded to the federal government in the year 1905 and is now held in trust for the benefit of irrigation and public development of power for irrigation purposes; (2) the surrender of the lake to the government by the state constituted the withdrawal of the waters from appropriation by any private corporation or individual; (3) the trust assumed by the government precludes any release of the water except by the consent and approval in writing of some formal official of the Federal Reclamation Service.

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Southern Sierras Co. Has Hoover Dam Contract

The Southern Sierras Power Company, of Riverside, Calif., has been awarded the contract to furnish power for the construction of the Hoover dam and incidental works on the Boulder Canyon project. Bids also were received from the Inland Utilities Company, Kansas City, and the Southern Nevada Power Company, of Las Vegas.

The Southern Sierras company's bid was considerably lower than the bids submitted by the other two companies, offering delivery of power over a single transmission line from San Bernardino or Victorville, Calif., at 1.729 cents per kw.-hr., plus 0.280 cent per kw.-hr. to cover the cost of an emergency standby plant near the dam site.

The bids of the Inland Utilities Company and the Southern Nevada Power Company were 2.444 cents and 2.802 cents, respectively. Their proposals involved construction of a temporary plant near the dam site to furnish all the power required.

Puget Sound Co.-Puyallup Suit Won by City

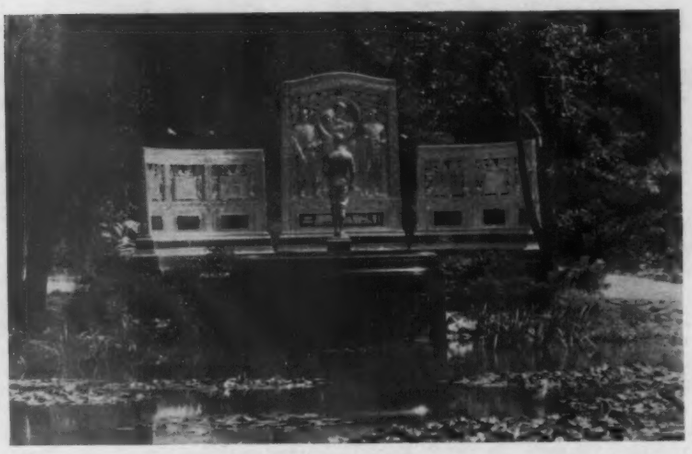
The suit of the City of Puyallup (Wash.) to condemn the local light and power distribution system of the Puget Sound Power & Light Company was decided in favor of the city in a sealed verdict delivered to Judge Edward E. Cushman in the United States District Court in Tacoma on Oct. 18. The verdict, which was returned by a jury after less than three hours' deliberation, placed $216,825.67 as the damages to which the company is entitled for the physical assets and severance of the company's property in Puyallup.

Indicating that the company will appeal from the verdict of the district court, counsel for the company took several exceptions to the court's instructions, particularly those relating to questions of whether the company had unduly aggravated damages of severance of the Puyallup plant from the rest of the system or overbuilt the system within the city. The jury was instructed by the court that the company could not be paid for such damages and construction costs, if found. Company counsel declared that no evidence was submitted justifying the instructions.

The alleged actions of the company in constructing an office and service building in Puyallup and in proceeding with reconstruction of the plant far beyond the program of the year's budget, were made the subject of vigorous attack in the argument of Attorney Leo Teats, representing the City of Puyallup. These construction projects, costing a total of $97,399, begun after the citizens of Puyallup had voted to purchase the system, were either an attempt to frighten the city into abandoning its attempt to acquire the system or to make it as difficult as possible, Mr. Teats declared. He also attacked the alleged refusal of the company to give city engineers access to its records for the purpose of valuation. He brought out that the company's taxes paid Pierce County suddenly leaped from $1,498 on a total assessed valuation of $38,000 for the Puyallup system, to $8,157 because, he said, the lower tax figure did not match the value of between $325,000 and $400,000 that the company desired to claim.

On the last day of the trial, the company attorneys, following the argument of Mr. Teats, offered to forego respondent's argument, if the petitioners would abandon their further argument. This offer was declined by Attorney Ernest K. Murray for the city, who told the jury that an average depreciated reconstruction value of the Puyallup plant, based on the testimony of three city valuation engineers and two company witnesses was $201,000, while for the severance damages, a figure of $12,000 would average the testimony of both sides, less an allowance in favor of the city of $2,000, because the city's figures were based on present service, while the company engineers had included betterments, he claimed. The total figure which represented a fair market value, based on all evidence, he said, was $213,000.

Westinghouse Memorial Unveiled



IN honor of the late George Westinghouse, founder of the Westinghouse industries, this memorial was dedicated and unveiled on Oct. 6 in Schenley Park, Pittsburgh, Pa. Present at the ceremony were the nation's leaders in industry, business, and research.

Daniel Chester French, foremost of America's sculptors, modeled the youth and the central panel of the memorial. This central panel carries a medallion of George Westinghouse working over his drafting board, supported on either side by a full relief model of an engineer and a skilled mechanic. The two flanking wings each comprise three panels, depicting six of the genius' achievements: the first alternating current distribution system, in the Chicago Exposition of 1893; the Westinghouse air brake; the railroad signaling devices; electrification of a railroad; development of the steam turbine; and the development of hydro-electric power at Niagara Falls.

Contributions from 54,251 persons financed the undertaking.

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P. G. and E. to Consolidate East Bay Service

In order to permit the consolidated operation of the Pacific Gas and Electric and the Great Western Power Companies' electric transmission systems in the East San Francisco Bay cities, the Pacific Gas and Electric Company has approved orders for the expenditure of $301,500 for additions to the Claremont substation and the construction of a double circuit steel-tower line. The Claremont plant is located near Lake Temescal at the head of Broadway.

The work will be started immediately, according to L. H. Newbert, division manager, and calls for the installation of four 40,000-hp. transformers, oil circuit breakers, and related equipment in a new addition to be built to the Claremont substation. A double-circuit, steel-tower line from the Claremont substation of the Pacific Gas and Electric Company to the Great Western Power Company line near Orinda also will be built.

This work, when completed, will establish a tie line of considerable capacity between the two systems, thereby permitting an exchange of power to meet emergencies in the event of storms or interruptions in service. It will also provide additional power to meet the increasing demands for electric energy in this section.

Centralia Plant Operating After Week's Shut-Down

After a shut-down of one week on account of low water in the Nisqually River and seepage through the banks of the canal carrying water to the waterwheels, the new hydro-electric plant built by the City of Centralia, Wash., and placed in operation in September, has resumed operation, carrying the entire load. During the shut-down, the plant could have carried part of the load, but the Centralia Light & Power Company, from which the city has purchased current for its distributing system for the last five years, and with which the city has a contract for standby service in emergencies, refused to furnish any current unless given the entire load.

The city contends that the company, under the contract, is required to furnish only the amount of power needed, but acceded to the latter's demand in the emergency. It is expected the controversy will be taken into court for a decision.

Great Western Stockholders to Receive P. G. and E. Shares

APPLICATION has been made to the California Railroad Commission by the Pacific Gas and Electric Company for authority to acquire 129,278 shares of the 7 per cent preferred stock (par value $12,927,800) and 48,965 shares (par value $4,896,500) of the 6 per cent series "A" preferred stock of the Great Western Power Company of California now outstanding, and 9,860 shares (par value $986,000) of 7 per cent Class "A" preferred stock of the Feather River Power Company.

In payment, Pacific Gas and Electric Company proposes to issue not to exceed 395,926 shares of its 5½ per cent first preferred stock of an aggregate par value of $9,898,150, and 356,486 shares of its 6 per cent first preferred stock of an aggregate par value of $8,912,150, these preferred stocks to be issued on the following basis:

Two shares of the 5½ per cent first preferred stock (par value $25 each) and two shares of the 6 per cent first preferred stock (par value $25 each), for each share of the preferred stocks of the Great Western Power Company (par value $100 per share); and four shares of 5½ per cent first preferred stock (par value $25 each) for each share of the preferred stock of the Feather River Power Company (par value $100 per share).

The Pacific Gas and Electric Company also has applied for authority to issue and sell at not less than par 100,000 shares of 5½ per cent first preferred stock (par value $25 per share), with an aggregate par value of $2,500,000, and to advance to the Great Western Power Company of California the proceeds of the sale of that stock for the purpose of enabling the Great Western company to call and redeem at par the outstanding shares of 6 per cent preferred stock of the California Electric Generating Company.

▼

Diablo Power House to Be Started This Year

Contract for construction of the Diablo power house, next step in the development of Seattle's Skagit hydro-electric project, will be awarded Dec. 1, according to R. H. Thomson, city engineer. Mr. Thomson states that the power house will probably be constructed by steps, as certain machinery is to be installed as the construction proceeds, and it will require eighteen months to complete the plant. Contracts for the machinery have been awarded to the Westinghouse Electric & Manufacturing Company, the S. Morgan Smith Company, and the Pelton Water Wheel Co.

The city council has before it now the question of appropriating an additional $25,000 for preliminary survey in the Ruby Creek basin on the upper Skagit River in preparation for the construction of another dam to cost from $5,000,000 to $6,000,000.

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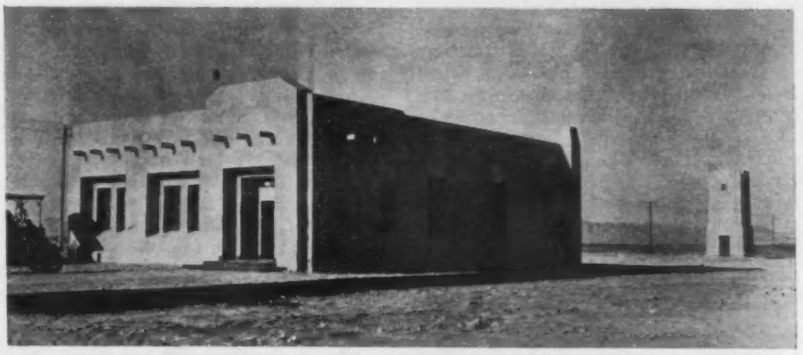
Nevada's First Arc Welded Building



FIRST structure to be erected in the state of Nevada by the use of electric arc welding is this toll building of the Bell Telephone Company at Las Vegas. The structural steel was fabricated and erected by the Pacific Iron & Steel Company, of Los Angeles, and the entire steel work was arc welded into place, using Lincoln Electric Company arc welders.

The building involved the erection of approximately 65,000 lb. of steel in its construction. Vertical columns are 8-in. H-beams and extend from the basement to the roof. There are no interior supports in the building above ground level. The floor is constructed of steel beams and slab, and the roof is suspended on trusses which extend the full width of the building. The water tower shown at the right stands 30 ft. high and is fabricated entirely of arc welded steel, including the 3,000-gal. tank.

Snake River Survey to Be Completed Soon

A ten-year survey of the water and power resources of the Snake River drainage area is now being completed, and reports will soon be made public, according to W. G. Hoyt, hydraulic engineer of the United States Geological Survey.

The survey has located 100 dam sites for power development and 25 sites for water storage, according to Mr. Hoyt. The study has included a great part of Idaho and has been extended into Wyoming near the headwaters of the south fork of the Snake and into Oregon where the Owyhee and other tributaries flow. The final work was done along the Salmon River.

Five months were spent on one of the major enterprises of the survey, the mapping and examination of the vast Snake River canyon below Homestead.

▼

400-Ft. Dam to Harness Pend Oreille River

The West Kootenay Power & Light Company will shortly apply to the B. C. Provincial Water Board for approval to construct a dam nearly 400 ft. high across the Pend Oreille River in British Columbia. The single dam project had formerly been dropped in favor of a two-dam development, but engineering examinations, now nearing completion, have convinced the company that the larger project is sound from an engineering standpoint, and the two-dam scheme will be abandoned. The company has already obtained water rights to harness the entire river, and governmental approval is regarded as certain.

The Reeves McDonald Mining Company, a former contender for the right to develop the Pend Oreille, recently withdrew its application, terminating a struggle which lasted more than a year. The mining company is applying for rights on the Salmon River, a tributary of the Pend Oreille, at a point where its work will not conflict with that of the West Kootenay Company.

▼

Salem (Ore.) Not to Vote on Power Bonds

Municipal ownership and operation of hydro-electric power plants is not as yet a welcome venture, in the opinion of the members of the city council of Salem, Ore. The council declined to pass an ordinance providing for presenting to the people at the November election a $5,000,000,000 bond issue for the purpose of acquiring a power system. The body did, however, consent to the adoption of an ordinance which refers to the people the question of the filing by the city of an application with the state engineer for a permit to appropriate the waters of the North Santiam River and Marion Lake for

the purpose of developing hydro-electric power.

The Northwest Power Company, a subsidiary of the Pacific Northwest Public Service Company, of Portland, has on file with the state a completed application for authority to appropriate the same water now being sought by the City of Salem. The present interference of the municipality has caused the officials of the private utility to issue the statement that if the city decides definitely to engage in the electric business and develop plants on the river and lake, the Northwest Power Company will abandon its plans for construction of a five-unit project in the district.

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B. C. PUBLIC UTILITIES COMMISSION ADVOCATED—At a recent convention of British Columbia municipalities, a resolution was carried calling for the appointment of a public utilities commission, "particularly to provide uniform rates charged by the B. C. Electric Railway Company and its subsidiary companies."

P.C.E.A.

Dealer Angle Prominent in Commercial Conclave

Dealer co-operation, in its more serious and better esteemed aspects, was a prominent feature of the load building plans for the year discussed and reported upon at the P.C.E.A. Commercial Section conclave in San Francisco, Oct. 23-24. In almost every department of work the part which outside merchants, dealers, and contractors can play in conjunction with power company programs to build load and fulfill the slogan of A. M. Frost, president of the P.C.E.A., "Continually Improving Electric Service to Our Customers," was prominent. Optimism as to the future business outlook was companion to this more serious consideration of the dealer angle of load building.

Sounding the keynote of optimism, E. G. Stahl, chairman of the Commercial Section, opened the conclave. This was taken up by A. M. Frost, who declared the whole industry to be more commercially minded than ever before. He reported on the national executive committee meeting in which the light and power industry was pointed toward better trade relations and a continued commercial effort along all fronts. K. I. Dazey, managing director, P.C.E.A., outlined the revised operation plan of the association's offices.

At the noon luncheon, Frank Weiss, vice-chairman of the section, made a brief talk. He was followed by Al C. Joy, Pacific Gas and Electric Company, who was enthusiastically optimistic in showing that "we are not so badly off as everyone says, and we can recall many times in our own memory when conditions were far worse than now."

At the sales symposium held on the afternoon of Oct. 24, bureau chairmen made their reports on projected activities for the year and three speakers addressed the conclave. A talking picture, just completed by the Puget Sound Power & Light Company, Seattle, titled "Looking Forward," was shown.

F. M. Rowles, general sales manager, L. H. Bennett Company, Ltd., in the course of a talk illustrated by simple objects used by his company's salesmen to compare various features of their refrigerator, pointed out the responsibility of the management in keeping the sales force itself sold on the company and product, and the importance of courtesy and good ethics. His prediction that control of marketing, involving control of manufacturing output and sales price, was inevitable, proved a strong climax.

Emil Brisacher, advertising executive, gave a quiet but very pointed talk on advertising, its need and its relation to salesmen, ending with a graphic story illustrating the important place imagination plays in advertising.

P. M. Downing, vice-president and general manager, Pacific Gas and Electrci Company, and vice-president of the N.E.L.A., in a talk on the importance of the sales department to the utility made an important declaration of policy from his own viewpoint. "Utilities need the dealers and dealers need the utilities," he said. "Their efforts should not be competitive. The utility is primarily concerned with the sale of a service. If it merchandises it does so to build up that service. Certain appliances which are not well known the dealers are not in a position to exploit sufficiently to gain acceptance. I am of the opinion that the utility should engage in merchandising these until they are accepted by the public. When that time arrives, then it is time for the utility to step out. But there is no reason why there should be any conflict."

Mr. Downing then discussed with equal frankness the matter of rates. He urged the commercial men to assist in making rates understandable. The time would come, he hoped, when some bright genius would come out of the commercial group to work out schedules of rates as simple for the layman to understand as those of the grocer, baker and butcher.

Reports of bureau chairmen which indicate the contemplated course of committee activity this year are briefly summarized in the following paragraphs:

Lighting Bureau—D. H. P. Dellmann, chairman. The bureau will arrange for the printing of 21 articles in trade magazines. These articles will have to do with correct lighting, showing the advantage of using 500-watt lamps instead of 150-watt units. One committee will promote outdoor sports such as night golf, tennis, roque, and bowling. It will encourage better floodlighting and better outdoor lighting for private residences. Power factor correction in Neon signs will be encouraged. All available data on street and highway lighting will be accumulated. A tie-in will be made with the Add-a-Lite campaign. Possible future radio broadcasts will be made, and the use of ultra-violet lamps in homes will be studied.

Merchandising Bureau—H. H. Courtright, chairman. Charts will be prepared of the peaks and valleys in appliance sales and an attempt will be made to educate merchants on the advisability of leveling these. Manufacturers will be asked to build appliances with filters and condensers to lessen radio interference. An attempt will be made to create a public acceptance of ironers and dish washing machines. A semi-technical manual on electric water heating will be prepared. The refrigeration committee aims to sell 60,000 units in 1931. Portable range wiring units for electric homes will be investigated. Longer use of radio advertising will be encouraged.

General Power Bureau—R. C. McFadden, chairman. The general power bureau will publish revisions of its agricultural handbook. It will also try to unify company rules governing the supply of temporary power to oil fields. Competitive power will be further studied.

All other committees reported considerable progress and the fixing of a definite objective for the year's work. The next conclave will be held in Los Angeles Jan. 15-16, 1931.

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Advertising-Publicity Section Holds Meeting

Concurrent with the Commercial Section conclave was the meeting of the Advertising-Publicity Section, of which R. G. Kenyon, Southern California Edison Company, Ltd., is chairman. Besides an informal discussion of a state-wide advertising campaign and a general discussion of organization matters for the coming year, the program included a forum on "Public Utility Advertising," led by Neil Wilson, of the San Francisco office of McCann-Erickson, Inc.

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N. R. Sutherland, P. G. and E. Co., treasurer.
K. I. Dazey, P. C. E. A., secretary.

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H. L. Harper, Graybar Elec. Co.
D. E. Harris, G. E. Supply Corp.
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F. B. Lewis, So. Cal. Ed. Co., Ltd.
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Painter, H., Tucson G., E. L. & P. Co.
Reynolds, L. A., P. G. and E. Co.
Simmons, E. N., L. A. G. and E. Corp.
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Terry, H. T., P. G. and E. Co.

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Construction Accounting Subcommittee

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Merchandise Sales Accounting Subcommittee

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Customers Billing and Accounting Subcommittee

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Cyr, W. A., Electrical West.
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Hartley, Victor W., P. C. E. A.

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Ingold, Ernest, Ernest Ingold, Inc.
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Fenton, J. H., Westinghouse E. & M. Co.
Hickey, D. H., P. G. and E. Co.
McIlroy, J. R., S. J. L. & P. Corp.
Pine, P. P., S. D. Cons. G. & E. Co.
Rhine, M., G. E. Co.
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Mechling, T. B., Nevada-Calif. Pwr. Co.
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Pike, N., Nevada Valleys Pwr. Co.
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Courtright, H. H., Valley Elect. Supply Co.
Day, A. B., L. A. G. and E. Corp.
Fisher, R. E., P. G. and E. Co.
Harper, H. L., Graybar Elect. Co.
Harris, D. E., G. E. Supply Corp.
Hitchner, A. E., Westinghouse E. & M. Co.

PUBLIC SPEAKING COMMITTEE

D. L. Scott, L. A. G. and E. Corp., chairman.
Arnold, J. S., Central Ariz. Pwr. & Lt. Co.
Cage, Albert G., So. Sierras Pwr. Co.
Hanna, T. A., So. Cal. Ed. Co., Ltd.
Lambert, W. A., S. D. Cons. G. & E. Co.
Seel, E. M., S. J. L. & P. Corp.
Worthington, W. A., P. G. and E. Corp.
Yates, C. T., Arizona Edison Co.

WOMEN'S COMMITTEE

Mrs. Nyra G. Letchworth, S. J. L. & P. Corp., chairman.
Edwards, Mrs. Marge Myrick, S. D. Cons. G. & E. Co.
Freeburg, Miss Alma, Coast Counties G. & E. Co.
Gaffney, Mrs. Mercedes M., Graybar Elect. Co.
Jackson, Miss Miriam, Hawaii Elect. Co., Ltd.
Jones, Miss Wilma D., Arizona Edison Co.
Molloy, Miss Nell, S. D. Cons. G. & E. Co.
Murray, Miss Marvel, L. A. G. and E. Corp.
Rees, Mrs. Jeanette L., So. Cal. Ed. Co., Ltd.
Tripp, Mrs. Mabel E., Valley Elect. Supply Co.
Weems, Miss Clyda, S. J. L. & P. Corp.

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W. DeWaard, S. D. Cons. G. & E. Co., chairman.
C. M. Richardson, So. Cal. Ed. Co., Ltd., vice-chairman.
Hickman, S. E., S. J. L. & P. Corp.
Hunt, J. H., P. G. and E. Co.
Kelley, C. A., So. Sierras Pwr. Co.
McCullough, W. J., So. Cal. Ed. Co., Ltd.
McKee, H. O., So. Cal. Ed. Co., Ltd.
Maddock, W., L. A. G. and E. Corp.
Mason, D. P., S. J. L. & P. Corp.
Watkins, E. F., So. Cal. Ed. Co., Ltd.
Weiss, C. D., S. D. Cons. G. and E. Corp.

PURCHASING DIVISION

C. A. Kelly, So. Sierras Pwr. Co., chairman.

PERSONNEL AND POLICIES COMMITTEE

E. F. Watkins, So. Cal. Ed. Co., Ltd., chairman.
Hulse, C. A., Central Arizona Lt. & Pwr. Co.
Hunt, J., P. G. and E. Co.
Parks, T., L. A. G. and E. Corp.

RECORDS COMMITTEE

T. Parks, L. A. G. and E. Corp., chairman.
Crick, E., Coast Counties G. & E. Co.
Hahoney, E. O., P. G. and E. Co.
Priest, W. I., So. Cal. Ed. Co., Ltd.

PROCUREMENT OF MATERIALS COMMITTEE

S. E. Hickman, S. J. L. & P. Corp., chairman.
Gray, J. L., So. Cal. Ed. Co., Ltd.
Nicklin, D. P., L. A. Bureau of P. & L.
Robinson, S. R., S. D. Cons. G. & E. Co.

TRAFFIC COMMITTEE

E. O. Mahoney, P. G. and E. Co., chairman.
Gamble, C. J., S. D. Cons. G. & E. Co.
Henry, F. F., So. Cal. Ed. Co., Ltd.
McWhorter, C. H., So. Cal. Ed. Co., Ltd.
Nicklin, D. P., L. A. Bureau of P. & L.
Reed, L. A., L. A. G. and E. Corp.
Sherwood, F., P. G. and E. Co.
Wood, E., P. G. and E. Co.

STORES DIVISION

W. Maddock, L. A. G. and E. Corp., chairman.

PERSONNEL AND REGULATIONS COMMITTEE

W. J. McCullough, So. Cal. Ed. Co., Ltd., chairman.
Castle, C. C., So. Cal. Ed. Co., Ltd.
Hanson, F. P., P. G. and E. Co.
Lore, C., So. Sierras Pwr. Co.
Weiss, C. D., S. D. Cons. G. & E. Co.

MATERIAL CONTROL COMMITTEE

W. R. Foster, L. A. Bureau of P. & L., chairman.
Bullard, E. O., L. A. G. and E. Corp.
LeGrande, R. V., So. Cal. Ed. Co., Ltd.
Peterson, A. T., S. D. Cons. G. & E. Co.
Scott, A. J., So. Sierras Pwr. Co.

MATERIAL TESTING COMMITTEE

H. H. Scoville, P. G. and E. Co., chairman.
Ennor, J. C., So. Cal Ed. Co., Ltd.
Foster, W. R., L. A. Bureau of P. & L.
Grummett, G. H., S. J. L. and P. Corp.
Richardson, G. M., So. Cal. Ed. Co., Ltd.
Waite, M. E., S. D. Cons. G. & E. Co.

BUILDING AND EQUIPMENT COMMITTEE

D. P. Mason, S. J. L. & P. Corp., chairman.
Hanson, F. P., P. G. and E. Co.
Lore, C., So. Sierras Pwr. Co.
Palmer, F., So. Cal. Ed. Co., Ltd.
Westrick, F., S. D. Cons. G. & E. Co.

DISTRICT STORES COMMITTEE

H. O. McKee, So. Cal. Ed. Co., Ltd., chairman.
Haslett, R. V., So. Cal. Ed. Co., Ltd.
Pennebaker, E. P., So. Sierras Pwr. Co.
Prentiss, L. A., Tucson G., E. L. & P. Co.
Ramage, W., S. D. Cons. G. & E. Co.
Shanahan, W. S., P. G. and E. Co.

SALVAGE COMMITTEE

E. O. Bullard, L. A. G. and E. Corp., chairman.
Fritzer, R. E., S. D. Cons. G. & E. Co.
Hunt, F, So. Cal. Ed. Co., Ltd.
Norbury, F., L. A. Bureau of P. & L.

MATERIAL RECORDS COMMITTEE

G. N. Riblet, S. D. Cons. G. & E. Co., chairman.
Lore, C. B., So. Sierras Pwr. Co.
McMillan, N., L. A. G. and E. Corp.
Scoville, H. H., P. G. and E. Co.
Steele, E. D., So. Cal. Ed. Co., Ltd.

STORES OPERATION COSTS COMMITTEE

A. A. Charonnat, P. G. and E. Co., chairman.
Bullard, E. O., L. A. G. and E. Corp.
Grummett, G. H., S. J. L. & P. Corp.
Riblet, G. N., S. D. Cons. G. & E. Co.

STORES ACCOUNTING DIVISION

A. A. Charonnat, P. G. and E. Co., chairman.

INVOICES COMMITTEE

F. Palmer, So. Cal. Ed. Co., Ltd., chairman.
Charonnat, A. A., P. G. and E. Co.
Grummett, G. H., S. J. L. & P. Corp.

SALES AND PETTY CASH COMMITTEE

N. McMillan, L. A. G. and E. Corp., chairman.
Palmer, F., So. Cal. Ed. Co., Ltd.
Riblet, G. N., S. D. Cons. G. & E. Co.
Scott, A. J., So. Sierras Pwr. Co.

STANDARDIZATION DIVISION

G. M. Richardson, So. Cal. Ed. Co., Ltd., chairman.

POLE LINE HARDWARE JOINT COMMITTEE

G. M. Richardson, So. Cal. Ed. Co., Ltd., chairman.
O. W. Holden, L. A. Bureau of P. & L., secretary.
Ayres, K. B., S. D. Cons. G. & E. Co.
Braun, C. E., Hubbard & Co.
Bullard, E. O., L. A. G. and E. Corp.
Condon, E. S., Maydwell & Hartzell.
Dillinger, F. E., L. A. G. and E. Corp.
DeWaard, W., S. D. Cons. G. & E. Co.
Dietrick, H. S., Joslyn Co.
Glosser, W. W., Hubbard & Co.
Guilbault, R. B., So. Cal. Ed. Co., Ltd.
Hagar, G. H., P. G. and E. Co.
Hanson, F. P., P. G. and E. Co.
Kelley, C. A., So. Sierras Pwr. Co.
Kortick, J. C., Kortick Mfg. Co.
Mess, C. T., Calif. Railroad Commission.
Minor, H. H., S. J. L. & P. Corp.
Nicklin, D. P., L. A. Bureau of P. & L.
Porter, E. Y., So. Sierras Pwr. Co.
Row, W. E., So. Cal. Ed. Co., Ltd.
Sherwood, F. R., P. G. and E. Co.
Tobey, G. O., P. G. and E. Co.
Young, C. E., P. G. and E. Co.

PACKAGES COMMITTEE

E. S. Condon, Maydwell & Hartzell, chairman.
Bullard, E. O., L. A. G. and E. Corp.
DeWaard, W., S. D. Cons. G. & E. Co.
Dietrick, H. S., Joslyn Co. of Calif.
Glosser, W. W., Hubbard & Co.
Scott, A. J., So. Sierras Pwr. Co.
Richardson, G. M., So. Cal. Ed. Co., Ltd.
Sherwood, F. R., P. G. and E. Co.

MANUFACTURERS COMMITTEE

W. W. Glosser, Hubbard & Co., chairman.
Braun, C. E., Hubbard & Co.
Condon, E. S., Maydwell & Hartzell.
Dietrick, H. S., Joslyn Co. of Calif.
Kortick, J. C., Kortick Mfg. Co.

LOAD BUILDING COMMITTEE

W. J. McCullough, L. A. G. and E. Corp., chairman.
Hickman, S. E., S. J. L. & P. Corp.
Maddock, W., L. A. G. and E. Corp.
Miller, E. P., So. Cal. Ed. Co., Ltd.
Olsen, H., S. D. Cons. G. & E. Co.

TRANSPORTATION SECTION

EXECUTIVE COMMITTEE

E. C. Wood, P. G. and E. Co., chairman.
V. W. Dennis, So. Cal. Ed. Co., Ltd., vice-chairman.
A. A. Schoff, P. G. and E. Co., secretary.
Dennis, V. W., So. Cal. Ed. Co., Ltd.
Ducker, P. H., So. Cal. Ed. Co., Ltd.
Fairbanks, Wm., So. Cal. Tel. Co.
Weiss, C. D., S. D. Cons. G. & E. Co.
Shaw, S. B., P. G. and E. Co.
Stanley, C. R., P. G. and E. Co.
Wainscoat, J. M., S. J. L. & P. Corp.

ORGANIZATION DIVISION

V. W. Dennis, So. Cal. Ed. Co., Ltd., chairman.
Prewett, J. B., L. A. G. and E. Corp.

TECHNICAL DIVISION

S. B. Shaw, P. G. and E. Co., chairman.
Moulton, J. S., P. G. and E. Co.

MAINTENANCE DIVISION

C. R. Stanley, P. G. and E. Co., chairman.
Schaef, W. J., L. A. G. and E. Corp.

BUILDING AND POWER TOOLS COMMITTEE

P. H. Ducker, So. Cal. Ed. Co., Ltd., chairman.
Dodge R. V., S. D. Cons. G. & E. Co.
Weiss, C. D., S. D. Cons. G. & E. Co.

VEHICLES COMMITTEE

Wm. Fairbanks, So. Cal. Tel. Co., chairman.
Rondot, E. M., So. Cal. Ed. Co., Ltd.

ACCOUNTING DIVISION

J. M. Wainscoat, S. J. L. & P. Corp., chairman.
Tisdale, H. D., So. Cal. Ed. Co., Ltd.

Meetings

Coming Events

California Electragists, Southern Chapter—Bi-annual convention at Breakers Hotel, Long Beach., Calif., Nov. 14-15, 1930.

Pacific Coast Electrical Association—Annual convention at Hotel Del Monte, Del Monte, Calif., June 24-26, 1931.

Commercial Section meeting, Los Angeles, Jan. 15-16, 1931.

Engineering Section meeting, Los Angeles, Dec. 10-12, 1930.

Purchasing and Stores Section meeting, Los Angeles, Dec. 11-12, 1930.

National Electric Light Association—Fifty-fourth convention and exhibition, Atlantic City Auditorium and Convention Hall, Atlantic City, N. J., June 8-12, 1931.

National Electrical Wholesalers Association—**Pacific Division**—Convention at Hotel Del Monte, Del Monte, Calif., Jan. 29-31, 1931.

Western Metal Congress and Exposition—Annual convention in San Francisco, Feb. 16-21, 1931.

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I.E.S. Holds Meeting for Industry Executives.

Designed to show the importance of illumination to the electrical industry, the Illuminating Engineering Society, San Francisco Bay Cities Chapter, recently held a meeting at which it entertained executives of power companies, wholesalers, and contractor-dealer establishments. The meeting, which was held at the Engineers' Club, San Francisco, was presided over by William Hanbridge, president of the chapter.

William P. Bear was the principal speaker, describing the results of surveys he had made of illumination promotion of the Pacific Gas and Electric Company, San Francisco, over some period of time. Several figures given to him were of significance to the industry. From P. G. and E. records he claimed that for every kilowatt connected to the lines of the company $106 in materials and labor had been developed for the contractor and through him the wholesaler and the manufacturer. For every dollar received by the power company from an electrolier on a street lighting system, there was represented $6.14 in materials and labor to the contractor.

Other speakers were Leonard L. Hobbs, Morris Hixson, Victor W. Hartley, and Clyde L. Chamblin. The latter, speaking as a contractor, stressed the importance of safeguarding the lighting intensities which the industry is finding the American public demands against the ignorant attack of those who would cheapen and cut down installations.

More Than 100 Indians Entertain at Rocky Mountain Division Convention

W. ALTON JONES, president of the National Electric Light Association, New York, is now a citizen of the Navajo Indian nation of New Mexico. Henceforth he will be known to his tribe as "Lightning Boy," the Indian of which is *E-E-Nee Ash Key*. Mr. Jones was adopted by the tribe during an impressive ceremony that was part of an Indian pageant produced for the entertainment of the delegates to the annual convention of the Rocky Mountain Division, N.E.L.A., Oct. 20-22, in Albuquerque, N. M.

Mrs. Jones, Harry Reid, chairman of the Public Relations National Section, N.E.L.A., C. N. Stannard, vice-president and general manager, Public Service Company of Colorado, Denver, and other N.E.L.A. officials and staff members witnessed the ceremony, which took place at night on the mesa three miles east of Albuquerque. More than 100 Indians, representing seven tribes, were present, including Princess Lou-scha-neya of the Chickasaw tribe, famous singer and reputed to be the most beautiful Indian girl in America.

In a ritual that has been used for hundreds of years but never written, Mr. Jones was presented with a handsome hand-made ceremonial robe by Haske Naswood, tribal leader. The Indians believe Mr. Jones to be a medicine man of the whites who is capable of jerking the lightning from the skies and converting it into light for earthy use, and it is in recognition of his ability as a "miracle worker" that he has been made a member of the tribe.

During the course of a banquet which opened a few minutes after 8 o'clock on Tuesday night, Oct. 21, at almost the same moment that Thomas A. Edison perfected the incandescent lamp 51 years ago, a telegram was sent to Mr. Edison congratulating him on his long life and health and the part he has played in building a great industry. Mr. Edison replied with a telegram reading as follows:

> I was indeed glad to know that the Rocky Mountain division remembered me on the fifty-first anniversary of the invention of the first practical incandescent lamp. Please accept my most cordial greetings.
>
> THOMAS A. EDISON.

James B. Wootan, editor, *Public Service Magazine*, Chicago, was the speaker at the banquet, his subject being "Miracles." Arthur Prager, manager, Albuquerque Gas & Electric Company, acted as toastmaster.

Paul S. Clapp, managing director, N.E.L.A., was one of the principal speakers at the convention, his subject being "Electric Utilities—Their Service and Prospects."

"During the past twelve months," he said, "730,000 new domestic customers have been added to our lines. In view of the curtailment of residential construction and the closer approach being made by the industry to 100 per cent wired homes for urban territory, this is a remarkable record. Rural electrification, which we might normally have expected would be retarded, has shown an increase of 13 per cent in the first seven months of this year. During the past year, the service has been extended to over 100,000 additional farms. In no period has there been such an increase.

"Best information from electric utility companies in the period immediately following the stock market deflation indicates that the investor confidence in the electric light and power companies was not disturbed, and it is expected that when complete information is secured it will show that the number of investors in the business has continued to increase."

"If We Don't the Politicians Will" was the subject of an address by Mr. Jones, who warned that the industry must tell its story to the public or the political racketeers would broadcast a version of their own. He said in part:

W. Alton Jones, alias E-E-Nee Ash Key, receives his ceremonial robe from Haske Naswood, tribal leader of the Navajos

> I would prefer to avoid a political discussion, not because I have no personal political convictions or no views on the attitude of the rank and file of politicians towards our business, for I assure you I have definite and concrete convictions and views on this subject. Nor would I avoid a discussion of this theme on the theory that it is not important to our industry, for I know of nothing quite so important at this time as a proper relationship between the political and economic institutions of the country.
>
> I approach a discussion of this subject with some reluctance because I realize that anything I might say on the subject of politics as a representative of the National Electric Light Association would be an invitation to every political racketeer in the country to launch a further tirade upon this business.
>
> The electrical industry stands ready to meet at the bar of public opinion any sane or worthy critic who has questioned the accomplishments or the integrity of our business. I am certain, however, that I am not unlike other spokesmen for this business when I approach with trepidation a word battle with political tricksters. I admit, with no sense of embarrassment or feeling of shame, that I am not a match in political chicanery for those buccaneers in politics who have gone up and down the land in recent years, seizing upon every sin

of omission or commission by any man engaged in the electrical business, as ample justification for general charges of vilification and corruption, leveled against a great industry which has done more to contribute to the prosperity of the American people in the last 50 years than any other business.

Other speakers and their subjects were: Herbert S. Sands, consulting engineer, Denver—"The Effect of General Business Development on Load Building"; F. F. McCammon, assistant superintendent, Public Service Company of Colorado—"Training Employees for Public Contact Work"; R. R. Rowell, Western Colorado Power Company, Delta, Colo.—"Rural Electric Development"; E. M. Rowland, Public Service Company of Colorado—"Are We Merchandisers or 'Specialists'?"; Clara Zillessen, Philadelphia Electric Company—"How the Women Can Help Sell Kw.-hr."; Harold T. Rankin, Public Service Company of Colorado—"More Adequate Lighting and Wiring for a Bigger and Better Load"; R. M. Morris, Mountain States Telephone & Telegraph Company, Denver—"Improvements in Telephony"; George Wehrle, Public Service Company of Colorado—"Butane Gas—Opportunity of Menace?"

Hon. Clyde Tingley, mayor of Albuquerque, gave the address of welcome at the opening of the convention, to which J. A. Clay, president, Rocky Mountain Division, N. E. L. A., responded.

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California C.R.E.A. Reports Progress

Co-incident with the Commercial Section conclave of the P.C.E.A., in San Francisco, the California Committee on the Relation of Electricity to Agriculture held one of its four yearly meetings at the Palace Hotel, Thursday evening, Oct. 23. The meeting followed a dinner and was presided over by Prof. H. B. Walker.

After reports of Secretary and Treasurer Ben D. Moses, each of the experimenters conducting one of the projects of the committee gave a resume of his work and results.

Both W. V. Cruess and R. L. Tracy reported on the sterilization of fruit juice by electrolysis tests applied to cider and to grape juice—with positive results so far in the former but none in the latter. The object was stated as that of finding the thermal death point of the yeasts, molds, and bacteria responsible for spoiling of fruit juices.

Encouraging results have developed in the tests to determine the effect of power interruptions on incubator operation, according to L. W. Taylor. The percentage of losses of chicks was found to be small on a twelve-hour power shut-off, if the room temperature did not drop below 70 deg. F.

Tests of the effect of soil heating in cold frames for the growing of vegetables out of season are in progress, J. R. Tavernetti reported. Similar applications have already been proved successful but these tests are to determine factors governing growth.

J. E. Dougherty told of results of experiments in the air requirements under electric brooders. The cone type, curtainless brooder is that being studied, it being felt that too great a concentration of heat develops in the center.

Cost and efficiency of walnut dehydration was described as a project once carried on, later discontinued and now revived, only to find the efficiency calculations of previous tests no longer holding. P. F. Nichols declared that he felt the recirculation of air would improve the efficiency. A motor load of 20 to 40 kw.-hr. per ton of nuts would thus be added to the 106 to 665 kw.-hr. per ton in heating.

W. B. Herms described his tests to determine the effect of light upon insects. Coddling moths seemed to be retarded in their egg laying flight at sundown by lighting up the orchard, he said, but the intensity required was not so economically produced as to compare with arsenic spraying, which has better results.

Construction of a general utility farm refrigerator was next described by J. R. Tavernetti from experience with this appliance at Davis. Mr. Tavernetti held out the hope that a farmer could build a sizable box and equip it, even to the making of ice, for about $800.

The meeting closed with a discussion of the possible study of the use of the "electric eye" for sorting olives and fruit, and a reading of the proposed short course on rural electrification to be held at Davis in December.

Personals

Westinghouse Moves Central Station Supervisors

R. J. COBBAN, since 1924 in charge of the central station division of the Westinghouse Electric & Manufacturing Company in Portland, has been appointed central station division supervisor of the company's San Francisco office. He succeeds W. P. L'Hommedieu, who recently was made manager of that office.

C. C. Boozier, since 1927 central station group leader in the Westinghouse San Francisco office, has been transferred to Portland to take up the duties Mr. Cobban reliquished.

Mr. Cobban entered the Westinghouse organization as an apprentice at East Pittsburgh in 1909 after graduation from the University of Minnesota as an electrical engineer. He was transferred to the sales department of the Butte office in 1910 and later became manager there. In 1923 he went to the Seattle office and since 1924 has been in charge of the central station division in Portland.

In the twenty years of his sales work Mr. Cobban has been active in the application of electric power to metal-mining operations, lumbering and the paper industry. During more recent years he has been spending a large portion of his time on the problems of

R. J. COBBAN

generation and distribution of electric power.

Mr. Boozier joined the Westinghouse company at its East Pittsburgh works in 1920 after graduation from the University of Arkansas. His work

C. C. BOOZIER

at the Westinghouse headquarters took him through the test courses and power transformer sales sections. After several years of this experience he was transferred to the San Francisco sales department where he entered the central station division and in 1927 was made leader of that group.

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HENRY BOSCH, JR., who for many years has been chief draftsman in the engineering department of the Pacific Gas and Electric Company, San Francisco, has been appointed chief of drafting and reproduction of that department.

R. B. BORLAND, formerly a lamp salesman with the Westinghouse Lamp Company, San Francisco, has joined the Los Angeles office of the company as a miniature lamp salesman.

L. M. Shreve a Pioneer in Wenatchee Power Sales

L. M. SHREVE, who recently succeeded Leslie R. Coffin as manager of the eastern district of the Puget Sound Power & Light Company, with headquarters in Wenatchee, Wash., is a pioneer in the electric power business in that city. He came to Wenatchee from Kentucky in April, 1909, and entered the employ of the old Wenatchee Electric Company, of which his uncle was president, as storekeeper in the warehouse. Subsequently he was transferred to the operating and construction department, first as groundman and then lineman. In 1912 he joined the meter department where he was successively meter reader, meter tester, and meter foreman, finally being placed in charge of substation installations.

In 1915, after having been with the company for six years, Mr. Shreve was transferred to the sales department,

L. M. SHREVE

and two years later became sales manager. In 1923 the properties were taken over by the Puget Sound Power & Light Company, becoming the eastern district. Under Mr. Shreve's guidance the eastern district power sales went ahead by leaps and bounds; merchandise sales grew from practically nothing, until today the sales per residential home customer are greater than in any other district of the company.

Mr. Shreve held the position of sales manager until Aug. 1, 1930, when he became manager of the eastern district.

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H. L. DOOLITTLE, chief designing engineer, Southern California Edison company, Ltd., Los Angeles, has been elected a manager of The American Society of Mechanical Engineers, New York. E. O. Eastwood, of Seattle, has been appointed as a representative of the society on the American Engineering Council.

AUSTIN STRONG, of San Diego, Calif., has been elected chairman of the California Institute of Technology branch of the American Institute of Electrical Engineers. George Ross, of Fillmore, Calif., is vice-chairman.

H. H. COURTRIGHT, president and manager, Valley Electrical Supply Company, Fresno, Calif., and C. J. Geisbush, Eastern sales manager of ELECTRICAL WEST, with headquarters in New York, have been appointed league councilors in California by The Society for Electrical Development, Inc., New York. Mr. Courtright will contact, as the society's representative, the electric clubs in Los Angeles, San Diego, and Long Beach. Mr. Geisbush will contact the Northern Counties Electrical Development League, Chico; the Oakland Electric Club; the California Electrical Bureau, San Francisco; Marvelous Marin Electric League, San Rafael; the San Francisco Electrical Development League; and the Electrical Development League of South Alameda County, Hayward.

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"Jack" Hayes Heads Seattle Electric Club

JOHN J. HAYES, treasury representative of the Westinghouse Electric & Manufacturing Company, with offices in the Lloyd Building, Seattle, was recently named to succeed Grover C. Burke as president of the Electric Club of Seattle. Since his inauguration into office the latter part of August Mr. Hayes has proved his ability as an executive officer in the appointment of the committeemen (named elsewhere in this issue of ELECTRICAL WEST) who will assist him during his term as president of the club, and in formulating a constructive and entertaining program for the ensuing year.

"Jack" Hayes, as he is commonly known, was born in Seattle and was

JOHN J. HAYES

educated in the grade and high schools of that city. Since graduation he has supplemented his education with university extension courses. As a boy he sold papers on Seattle's streets. In 1909 he entered the employ of the Westinghouse company, leaving during the period of the World War to serve in the United States Navy, and rejoining the company at the close of the war. Mr. Hayes is something of an artist in male chorus work, and an enthusiastic golfer.

R. C. GEPPERT, a graduate of Stanford University and a former employee of the Pacific Gas and Electric Company, San Francisco, has been made general superintendent of the Nebraska Power Company, Omaha, Neb., with direct supervision over the merchandise, transportation, accident prevention and claim departments. Mr. Geppert was formerly assistant general superintendent of the company.

W. S. STEWART, formerly in charge of the Pacific Coast offices of The Lincoln Electric Company, of Cleveland, Ohio, has been made district manager in charge of the company's Cleveland territory with offices at the factory. Prior to coming to the Pacific Coast Mr. Stewart had spent several years at the Lincoln company's factory studying, demonstrating and applying the arc welding process.

DR. FRANK B. JEWETT, vice-president, American Telephone and Telegraph company, and president, Bell Telephone Laboratories, Inc., was the feature speaker at the regular Monday luncheon of the Los Angeles Electric Club on Oct. 20. Dr. Jewett took for his subject, "Some Present-day Problems in Electrical Communication."

GEORGE C. RICHARDS, special representative of the American Circular Loom Company of New York, recently spent about a month on the Pacific Coast, working with the company's representatives in that territory, Utilities Equipment Corporation, Ltd., Los Angeles, and C. R. Dederick, Portland, Ore.

B. E. ROWLEY, district sales manager, Edison General Electric Appliance Company, Denver, distinguished himself at a recent golf tournament held by the Electrical League of Colorado by making a hole in one. He also won the low gross prize with a 79.

CARL E. JOHNSON, president of Sterling Electric Motors, Inc., Los Angeles, attended a meeting of the National Electric Manufacturers Association at Old Point Comfort, Va., late in October. His plans contemplated a six weeks' sojourn in the East.

H. L. GERSTENBERGER, assistant sales manager, Weston Electrical Instrument Corporation, Newark, N. J., spent two weeks on the Pacific Coast in October conferring with the company's representatives in Los Angeles, San Francisco, and Seattle.

Obituary

OSCAR STULL MOORE, a former branch manager for the Los Angeles Gas and Electric Corporation, died in Los Angeles Oct. 9, at the age of 78.

Inspectors Turn Adequacy Back to the Industry

ADEQUACY, whether it should be written into codes and ordinances or turned back to the industry as a selling job, presented one of the most interesting of the many phases of electrical inspection problems discussed at the seventh annual convention of the Southwestern Section, International Association of Electrical Inspectors, at Pasadena, Calif., Oct. 6-8, 1930. That only minimum adequacy could be legislated and that the matter of securing it was a selling function on the part of contractors, power companies and manufacturers, was the decision reached. This was in the form of a resolution passed by the association at its final session.

January 1 was set as the date on which to begin the enforcement of the California State Industrial Accident Commission rule respecting the use of horsepower rated switches on motor circuits operating at voltages between 300 and 600 volts and protected by fuses rated at not over 200 amp. This will give manufacturers of enclosed motor switches time to revise designs and submit switches to the Underwriters' Laboratories for test and approval and also allow existing stocks of such switches to be sold out.

Another resolution paving the way for uniformity and simplification of

Not according to code, but perfectly dignified for their picture, were Claude W. Mitchell, secretary, and A. E. "Bert" Johnstone, president of the Southwestern Section

codes followed the statement of George Kimball, electrical engineer, California Industrial Accident Commission, that as soon as the National Electrical Code could be made to cover essential safety requirements the separate State Safety Orders would gladly be discontinued. This resolution was presented by Carl E. Hardy, of Oakland, and asked the commission to make an early revision of its rules, and in doing so consider seriously making the National Electrical Code the basis for the new orders.

The three actions just referred to were but a small part of the three-day convention, begun with greetings from City Manager R. V. Orbison of Pasadena and the address of the section president, A. E. Johnstone, of San Diego. Mr. Johnstone stressed the undermining effect on wiring standards which is resulting from work done by so-called handy men without subsequent inspection, a situation calling for regular re-inspection. Co-operation with power companies in working out rules which will not retard growth and yet provide safety, and the need for county inspection, were other points he made.

Professor Royal W. Sorensen, Pasadena Institute of Technology, gave the principal address of the opening session, taking his listeners into future electrical transmission methods which laboratory experiments of today predict. He visualized inspection of the future as concerning itself with the extremes of milivolts and millions of volts, and of one-millionth second time intervals in radio interference problems. He asked his listeners not to be surprised if transmission returned to direct current, pulsating in character and replacing alternating current. Vacuum switches may become something to inspect in future installations. His description of his institution's experiments in high-voltage transmission problems, in high-voltage X-rays, producing the equivalent of radium emanations, and in lightning control and protection aptly preceded a visit to the Institute by the convention delegates on Wednesday afternoon, at which time a number of 800,000-volt discharge experiments were demonstrated.

Electragists Plan Long Beach Meeting

Taking the place of the usual fall state convention, the Southern Chapter, California Electragists, has announced a meeting of its members only to be held at the Breakers Hotel, Long Beach, beginning Friday noon, Nov. 14 and closing Saturday noon, Nov. 15, 1930. A luncheon will begin the convention. A stag dinner is planned for Friday evening followed by entertainment furnished by the Long Beach branch. Special hotel rates have been arranged for those who wish to stay at the hotel on Friday or even Saturday night. Though a stag convention, entertainment is being provided for any women who attend by the wives of the Long Beach members. Details of the arrangements and reservations are to be obtained from the offices of the association at 609 Cotton Exchange Building, Los Angeles.

"Many a special rule is already in the code and in better form than the special rule itself," said William M. Boyd, Chicago, president of the I.A.E.I., in the course of an inspirational address urging members to develop their knowledge not only of the code but of themselves, rather than to seek more power of enforcement. "Inspectors do not need more power, they need more knowledge," he said. It was a plea for better inspector ability, for an attitude of mind which would treat the public as one's client. "Lead more—direct less" was his final suggestion.

Hawaii sent W. A. F. Branco, its chief inspector, to lure the 1933 convention to its tempting tropical shores

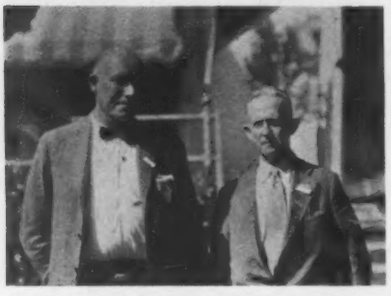
"Back to the Code," a playlet presented under the direction of H. C. Rice, Southern California Edison Company, Ltd., told amusingly and yet convincingly the problem run into by a young couple intending to build and provide for an electric home in any one of several nearby localities where differences of special rulings exist. It made a case for uniformity and for acceptance of the code as the universal wiring guide.

A Penn Denton, engineer-director, armored cable section, National Electrical Manufacturers Association, in his talk, "Can We Legislate Adequate Wiring?" brought forth an interesting study. He said that in localities where only one wiring system was permitted not only were the number of outlets installed per residence reduced and hence those installed loaded more with cords, but the competitive situation between contractors became more accute. The contractors who normally would stay with an inexpensive type of wiring installation and specialize on it would break into the field of the Class A construction group to a greater extent where there was no division of field created by difference in wiring methods. The entire subject of adequacy then received considerable discussion, localities having all-metal ordinances claiming no curtailment of outlets, and indeed economy, in that one wiring method developed labor speed and reduced material stocks enough to make up for the apparent higher material cost.

W. V. Houston, of the California Institute of Technology, opened the Tuesday morning session with a popular description of the methods by

which Dr. Millikan and others of the Institute have sought to determine whether electrons are corpuscles or waves, the present theory being that the electron has properties of both.

H. B. Kirkland, The Society for Electrical Development, Inc., New York, was the next speaker, urging uniformity, or, as he put it, unity of codes. He described some of the steps necessary to adjust ordinances to



Hosts to the convention were R. V. Orbison, city manager (left) and Fred Vore, city electrician of Pasadena

local charter conditions; told how it is necessary in some places to adopt a bill of equivalents so that expensive changes in ordinances may be obviated; urged sending copies of proposed ordinances to the society for review and advice as to what it is unwise to include, and pointed out the constant effort to simplify the standard ordinance.

Ralph Wiley, reporting on the State Safety Orders, precipitated the discussion which terminated in the actions already described. Another ruling of the commission reported by Mr. Kimball was that permitting the motor tables of the code to supersede the tables in the safety orders pending revision of the latter.

H. H. Walker, representing the Electragists, opened the afternoon meeting. He made a strong plea, almost a demand, for uniform ordinances. He was followed by two speakers from the Frank Wiggin Trade School, J. G. Miller, its principal of evening calsses, and E. F. Reynolds, electrical engineer in charge of electrical classes. More detailed description of the work of this school is contemplated in an early issue of ELECTRICAL WEST so will not be given here. In commenting on the courses, Mr. Boyd urged teaching the other crafts to respect wiring and protect it during building operations.

J. S. Mahan, chairman of the national membership committee, was the only speaker at the Wednesday morning session, describing the growth and plans for future growth of the association. All of the intervening time between addresses was spent in taking up one at a time the various articles of the National Electrical Code and discussing possible improvements or changes to be recommended to the electrical committee. A number of interesting points were brought forward.

On armored cable and non-metallic sheathed cable, as indeed on thin wall conduit, no revision was asked, but field tests and records of any failures which might occur were asked to be kept for future reference. It was decided to make further study also of demand factor conditions in air heating installations before revising present tables.

Article 8 revision recommendations were numerous, since this article deals with automatic overload protection of circuits and appliances. Mostly they were changes tending toward more clarity or consistency. A new rule was urged on "protection of taps," connections from feeders, subfeeders or buses to cutouts or circuit breakers, allowing less carrying capacity under certain conditions. The rule in Article 9 calling for jumpers around water meters was interpreted to apply only to cases where water meters were installed indoors.

Co-operation was urged with the Pacific Building Officials Conference on unity of rulings governing the construction of moving picture booths and film storage rooms.

In the Article 50 report an interesting article was read from the *Journal of the American Medical Association* wherein the matter of grounding or insulation of apparatus, and even the patient, was discussed because of the hazard found to exist from static charges where a room

In a report on standard forms for inspection departments the committee chairman, A. Veit, Alhambra, exhibited the forms suggested. (See ELECTRICAL WEST, Sept. 1, 1930, p. 122.)

Mr. Boyd made a suggestion based on his observation of the difference of experience with wiring applications and problems between Eastern and Western inspectors. He urged the formation of a coordinating committee to bring together the experience of all sections on the subjects of (1) service entrances, (2) grounding, (3) adequacy provisions, (4) 15-amp. branch circuits, (5) appliance branch circuits, (6) rules found to be unenforceable, (7) fixture wiring requirements, (8) showwindow equipment, (9) signs, and (10) range wiring, and possibly obther subjects. On a motion made by R. H. Manahan, Los Angeles, the executive committee was instructed to formulate a plan for carrying this out.

A suggestion from Mr. Denton regarding manufacturers' exhibits met with approval. Instead of each manufacturer making an exhibit of his products, Mr. Denton suggested that under the sponsorship of the N.E.M.A. an educational exhibit be worked up, showing the various wiring methods, the materials and fittings properly used, and some of the applications and advantages of each. Instead of a salesman in attendance at such an exhibit he suggested an engineer, capable of exchanging the manufacturers' engineering reasons with the inspector's practical field experience, and returning suggestions to the former for improvements in design.

Victor Tousley, secretary of the I.A.E.I., was active in the discussion of many of the code rules and interpretations. He also talked on the progress of the association and its work for standard forms, uniform enforcement, and investigation of electrical fires and accidents.

Ralph Wiley, chief, department of electricity, San Francisco, was elected president of the association following the resignation of E. H. Snedaker, chief electrical inspector, San Jose, Calif.

J. M. Evans, electrical engineer, Board of Fire Underwriters of the Pacific, Los Angeles, was named first vice-president. Edward W. McLaughlin, city electrician, Richmond, Calif., was named second vice-president, a new office created this year by revision of the constitution. To the executive committee were named the retiring president, A. E. Johnstone, San Diego; H. N. Beecher, chief inspector, Los Angeles, as the active member; H. C. Rice, Southern California Edison Company, Ltd., as the associate class A member; W. Wesley Hicks, Wesix, Inc., San Francisco, as the associate class B member. Carl Hardy, superintendent, electrical department, Oakland, was re-elected a member of the I.A.E.I. executive council. C. W. Mitchell, electrical engineer, Board of Fire Underwriters of the Pacific, San Francisco, was re-elected secretary-treasurer.

Convention committees appointed by President Johnstone were as follows:

Nominating: Frank Short, chairman; R. J. Larabee, and J. I. Dixon. Resolutions: E. J. Crawford, chairman; Ben Hill and H. V. Dobson. The committee to select the next meeting place: H. G. Ufer, chairman; Fred Vore, and Ralph Wiley. The convention reception committee consisted of A. Veit and Mrs. A. E. Johnstone. Registrations were handled by Miss Doris L. Strawn. Fred Vore, city electrician, Pasadena, was an ever thoughtful host to the convention.

The life of the convention, however, was the section's farthest-west and farthest-south member, William A. F. Branco, electrical inspector, City and County of Honolulu, T. H., who brought persuasive arguments, colorful leis, convincing literature and the hospitable spirit of Hawaii to the convention. His bid for the 1933 convention of the association received the plea of Mr. Boyd and others that serious consideration be given the idea and ways and means sought to take the convention to Honolulu, or rather on the boat going and coming from the Islands.

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HOBSON'S HOME WARE, 1245 Granville St., is a newcomer in the electrical merchandising field in Vancouver, B. C. The store features electric washers, ranges, and other appliances.

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W. WELLS HARPER RADIO ELECTRIC STORE, formerly located at 42 Huntington Drive, Arcadia, Calif., has moved into a new open front store at 30 Huntington Drive, Arcadia.

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Big ordinance and cable men from New York were Harry Kirkland, of S.E.D., and A. Penn Denton, of N.E.M.A.

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SPEAKING TO A MEETING of the Electrical League of Utah recently, Prof. A. LeRoy Taylor, professor of electrical engineering at the University of Utah, said in effect that there was a good deal of "soldiering" in the industry which resulted in a great bulk of electrical merchandising going through other than electrical dealers. He suggested that the industry might adopt a slogan such as, "Buy Your Electrical

Goods From an Electrical Store." The keynote of his talk seemed to be that electrical dealers should exert every effort to keep the electrical merchandising within the industry and to demonstrate to the public that the electrical dealers are up-to-date in all respects.

CHARLES J. READING, newly elected president of the International Association of Municipal Electricians, has been city electrician of Salt Lake City for the past seventeen years. Prior to that time he was an electrician for the Utah Power & Light Company and the Mountain States Telephone & Telegraph Company. Mr. Reading was chairman in charge of arrangements for the 1927 convention of the association in Salt Lake City.

P. D. WINTER ELECTRIC COMPANY, of Wenatchee, Wash., was started in March, 1930, by P. D. Winter, formerly connected with the Electric Supply Company, of Wenatchee. Mr. Winter specializes in pumping and irrigation installations and is representative for several lines of pumps and motors.

A NEW SECRETARY is to be appointed for the Berkeley Electrical Dealers Association, according to the president, Al Smith, of the Smith-Erickson Electric Company, of Berkeley. F. B. Carroll, Campanile Electric Company, is vice-president of the organization. The former secretary resigned to resume college work.

THE DENVER ELECTRICAL CONTRACTORS ASSOCIATION recently established a quantity survey bureau for the benefit of its members in an attempt to stabilize competitive bidding and to avoid mistakes in estimating. Lee Matoon has been engaged as estimator in charge of the bureau. Quantities of materials and unit hours of labor are estimated, but no pricing whatever is done by the bureau.

THE ENTERPRISE ELECTRIC WORKS, San Francisco motor specialists and industrial wiring contractors, have recently consolidated their former two shops in San Francisco into a single establishment at 1164 Mission St., where extensive alterations, remodeling and re-equipping have been conducted.

J. W. HEAP electrical contractor-dealer of Willits, Calif., has moved into larger and more centrally located quarters. The enlarged store has allowed the display of an added line of electrical appliances.

F. J. SMITH, estimator for the H. H. Walker Company, Electragist of Los Angeles, has been in Honolulu superintending installations being made there by the Walker company.

HARVEY M. OLMSTEAD was recently appointed secretary of the Denver Electrical Contractors Association to fill the vacancy made by the resignation of George A. Graveline. Mr. Graveline has accepted a position which he expects will keep him outside of Denver a good deal of the time.

Manufacturer Distributor

Sales Meeting and Show Put on by Graybar Co.

A sales convention and show for its southern California distributor was staged by the Graybar Electric Company, of New York, Oct. 15, at the assembly hall of The Pacific Telephone and Telegraph Company, Los Angeles. Harry Goldrick, merchandise manager for the company, was in charge of arrangements for the highly successful event.

The entertainment began with a dinner prepared by home economists and cooking experts, including Prudence Penny, of the *Los Angeles Examiner*, Mildred Kitchen, of the *Los Angeles Herald*, and Chef Weyman, of the *Los Angeles Times*, under the direction of Mercedes M. Gaffney, home economist for the Graybar company. Dinner was served to 300 guests, including representatives of the Southern California Edsion Company, Ltd., Los Angeles Gas and Electric Corporation, and the Bureau of Power and Light. Dealers from all parts of southern California were also in attendance.

After the dinner talks were given on the various appliances carried by the wholesalers. Talks on washers and sweepers came first. Then a talk on the Hoffman Thermador heater was given by Harry Daley, general sales manager of the Hoffman Specialty Company of California, Ltd. Manning-Bowman appliances for the Christmas season were explained and described by Scott Fuller, of that company. H. L. Harper, district manager of the Graybar company, Los Angeles, gave a talk on dealer co-operation. Harry Goldrick, besides acting as master of ceremonies, spoke on the complete Graybar line, laying particular stress on the fact that radio dealers could improve their position by selling other appliances also.

One of the clever features of the convention was a playlet, "Service With a Smile," written by Don Porter, which was in the nature of an impressionistic imitation of motion picture, talkie, and radio. The situation was built around a young mother calling, presumably, a doctor, to report the illness of her child and being inadvertently connected with a Graybar salesman who proceeded to sell her all sorts of appliances.

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Hotpoint To Build Range Factory in California

Plans for the erection of the first unit of a range factory to cost about $250,000 have been announced by the Edison General Electric Appliance Company, Inc. This unit, which will occupy an area of 30,000 sq.ft., will be an addition to the present Hotpoint electric appliance factory in Ontario, Calif., and is expected to be in production within six months.

At the present factory are made all the air heaters and heating pads which the company markets throughout the United States. Water heaters, irons, toasters, and a general line of appliances are also products of the Ontario factory. Hotpoint ranges for Pacific Coast distribution have heretofore been supplied from Chicago, and the new factory in southern California will enable the company better to serve the growing market for ranges on the West coast.

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Hoffman Organizes California Company

The Hoffman Specialty Company of California, Ltd., has been formed to take over the electric heater manufacturing business of the Hoffman Specialty Company of Waterbury, Conn. Headquarters for the new company will be in Los Angeles at 612 Architects Building, although a new factory has been opened in San Francisco. The Eastern company will continue to manufacture steam heating specialties.

Officers of the new company are George D. Hoffman, president; Harry H. Daley, vice-president and sales manager; and Potter Bowles, treasurer.

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Large Circuit-Breaker Order Sent to Texas

THESE oil circuit breakers were recently shipped to a Texas utility by the Pacific Electric Manufacturing Corporation, of San Francisco. Included in the order were eight 138-kv. and two 69-kv. breakers. Three carloads of switch oil and nearly two carloads of porcelain entrance bushings brought the shipment to nearly eleven carloads of freight on the one order.

Factory Representatives in Consolidation

The Utilities Equipment Corporation, Ltd., 110-120 North Alameda St., Los Angeles, has announced that Jones-Lyman & Company, Inc., of San Francisco and Los Angeles, and The Utilities Equipment Corporation, Ltd., have consolidated and will operate under the name of the latter exclusively. The Utilities corporation is direct factory representative for the following companies in the territories shown:

American Brown Boveri, Inc., southern California. Condit Electrical Manufacturing Company, southern California. Railway & Industrial Engineering Company, southern California. American Circular Loom Company, California. National Electric Products Corporation (American Copper Products and British American Tube Division), Pacific Coast. Cleveland Brass Manufacturing Company, Pacific Coast. Coffing Hoist Company, Pacific Coast.

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Frigidaire—Radio Sales Alliance Announced

Frigidaire Corporation and General Motors Radio Corporation, of Dayton, Ohio, both subsidiaries of General Motors, have formed an alliance which will make it possible in many instances for their respective dealers to handle both lines.

While not all General Motors radio dealers will at this time have an opportunity to sell Frigidaire, nor all Frigidaire dealers be permitted to sell General Motors radio, the plan contemplates the same dealers receiving franchises for both commodities where such an arrangement can be made consistent with the policies of both organizations.

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CARBON COMPANY WILL SELL GREDAG LUBRICANTS—Beginning Nov. 1, the entire line of Gredag lubricants will be distributed and sold by the carbon sales division of the National Carbon Company, Inc., with headquarters in Cleveland. This addition is considered logical because of continuous contact with industrial plants and distributors of industrial products throughout the country. Sales and technical service on the lubricants will be available at all branch offices, including San Francisco.

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THE ELECTRIC HEATING & MANUFACTURING COMPANY, 600 Harrison St., Seattle, has been reorganized, and the company's name changed to Paramount Heating, Inc., with new products added to the firm's line of heating appliances. The company plans a 25 per cent increase in production, with its factory force increased to 100, according to Howard W. Jewell, vice-president and managing director. Tentative plans for additions to the present building are under way.

ELECTRIC SIGNAL COMPANY, LTD., 411 Architects Building, Los Angeles, has announced the appointment of the following distributors for Velvatone chimes: General Electric Supply Corporation—Pacific Coast territory; Electric Time Company, Inc., of Philadelphia—eastern Pennsylvania, New Jersey, Delaware, and Maryland; Velvatone Sales Company of Ohio, of Cleveland—Ohio and Michigan; C. E. Turpin, of Omaha — Nebraska and western Iowa; and Helt Brothers, of Pittsburgh, Pa.—(territory not designated.)

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Manifold for Tacoma's Cushman Plant

THIS 17-ft. diameter manifold with three 10-ft. 6-in. diameter branches has been fabricated at the South San Francisco plant of the Western Pipe & Steel Company of California for the City of Tacoma's Cushman No. 2 power project. Two of the manifold flanges are equipped with 10-ft. 6-in. butterfly valves from which the twin penstocks lead. The third branch has a blind flange pending future requirement of the third penstock.

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TO DISTRIBUTE MARION RANGES IN NORTHWEST — Marshall Wells Company, with branches in Spokane, Seattle, and Portland, has been appointed distributor in the Northwest of the Marion electric range manufactured by the Rutenber Electric Company, of Marion. Ind. The distribution of other electric appliances manufactured by the Rutenber company is being handled in the Northwest by R. C. James, 2321 Second St., Seattle.

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B. C. PREMIER VACUUM STAFF ENTERTAINED—Executives and members of the British Columbia sales staff of the Premier Vacuum Company, Ltd., were the guests recently of M. P. Tuteur, managing director of the firm, at a dinner at the Hotel Georgia, Vancouver, B. C. The entertainment was held during the visit to British Columbia of Mr. Tuteur.

Domestic Electric Company Now Black & Decker

S. Duncan Black, president of The Black & Decker Manufacturing Company, Towson, Md., has announced the change of the name of The Domestic Electric Company, Kent, Ohio, manufacturer of fractional horsepower motors, to The Black & Decker Electric Company. The company, which has been wholly owned by The Black & Dacker Manufacturing Company for more than a year, will continue to manufacture the same products.

Officers of the new company are: R. J. Lamb, president; M. H. Spielman, vice-president and general manager; O. C. Kiehne, treasurer; A. E. Nash, secretary; and Walter Poese, plant manager.

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EDISON COMPANY ORDERS 8,000,000 LB. OF COPPER WIRE—Orders for its full requirements of copper wire for the rest of this year and for the twelve months of 1931 have been placed by the Southern California Edison Company, Ltd., Los Angeles, with the Anaconda Copper Company. The orders cover approximately 8,000,000 lb. or 50,000,000 ft. of covered and uncovered wire. The bulk of the material will be utilized for distribution service, and nearly half of the deliveries will be made from the Anaconda company's plant in Orange, Calif., where the weather-proofing material required for a part of the order is manufactured.

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GENERAL CABLE RE-ORGANIZES — Twelve divisions of the General Cable Corporation, including the A-A Wire Company, American Insulated Wire & Cable Company, Atlantic Insulated Wire & Cable Company, Detroit Insulated Wire Company, Dudlo Manufacturing Company, Peerless Insulated Wire & Cable Company, Phillips Wire Company, Rome Electrical Company, Rome Wire Company, Safety Cable Company, Standard Underground Cable Company, and Southern States Cable Company, will in the future operate as one organization. All sales, manufacturing, and accounting activities which were formerly carried on independently will in the future be transacted in the name of the General Cable Corporation.

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THE NATIONAL POLE & TREATING COMPANY, Everett, Wash., has received an order from the Puget Sound Power & Light Company, Seattle, for 1,671 cedar poles, aggregating $40,000 in value, to be used in transmission line construction in connection with the power company's Rock Island development on the Columbia River. The poles will vary in length from 55 to 85 ft., and will be creosoted in the Everett yards of the pole company. Delivery will be made at various points between Skykomish and Wenatchee, Wash.

McGraw Manufacturers Awards Are Presented

Presentation of two manufacturers' medals and purses for 1930 under the James H. McGraw Award was made at the convention of the National Electrical Manufacturers Association held last month at Old Point Comfort, Va.

Lee F. Adams, commercial engineer with the General Electric Company, was given the award in recognition of his constructive contribution to the manufacturing branch of the electrical industry through his long and arduous service and his outstanding leadership in the co-ordination and advancement of the standardization and simplification of electrical products.

R. W. E. Moore, engineering manager of association activities for the Westinghouse company, received the award for his invaluable service in the co-ordination and development of codes and standards to control the fire and casualty hazards of electrical apparatus and supplies.

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Cable Contracts Let by City of Pasadena

Contracts have been let as follows for the supply of 40,219 ft. of cable, to cost $32,042.37, to the Pasadena (Calif.) municipal light and power department:

Anaconda Wire & Cable Company and General Electric Supply Corporation, 15,221 ft., $7,686.53.

General Cable Corporation, 16,673 ft., $19,507.96.

Okonite-Callender Cable Company, 8,325 ft., $4,847.88.

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SAN FRANCISCO PLANTS GET 12,000,000-LB. COPPER ORDER—Taking advantage of the low price of copper in the present market, the Pacific Gas and Electric Company, San Francisco, has placed orders with the Anaconda Copper Company and the General Cable Corporation, in equal amounts, for 12,000,000 lb. of copper at 10 cents per lb. All of this copper will be delivered in the form of wire or cable of various sizes and types, and, including the cost of manufacture, the total cost will exceed $1,500,000. A substantial part of the raw copper covered by these orders will be fabricated in the San Francisco Bay plants of Anaconda and General Cable. The fact that both these companies have local plants was a deciding factor in giving the business to them, the Pacific company states.

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SIERRA EQUIPMENT CORPORATION, exclusive distributor of the products of the Oliver Iron & Steel Corporation, Pittsburgh, Pa., now carries large stocks of Oliver pole line construction materials in warehouses at San Francisco, Los Angeles, and Seattle, according to L. Q. Trumbull, secretary-treasurer of the corporation. These stocks include a line of copper ground rods recently placed on the market.

STEEL AND TUBE, INC., APPOINTS WESTERN REPRESENTATIVES—Arrangements recently were completed whereby the electrical division of Steel and Tubes, Inc., of Cleveland, Ohio, will be represented on the Pacific Coast as follows: H. H. Benfield, 201 Underwood Building, San Francisco, will handle sales in northern California; Kenneth M. Anderson, 823 San Fernando Building, Los Angeles, will be in charge of southern California sales; and in the Northwest the firm will be represented by H. H. Walker, of Seattle.

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ENLARGES LOS ANGELES STOCKROOM—A store adjoining its property at 449 South San Pedro St., Los Angeles, has been taken over by the Electrical Specialty Company, Inc., and is being remodeled to add 2,600 sq.ft. to the company's former stockroom space. A mezzanine floor is being built into the new store to make it conform to the arrangement existing in the present stockroom.

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REDDEN & BISHOP & COMPANY, LTD., have been appointed distributors in British Columbia and the Yukon territory for Frigidaire and Delco Light products. The firm has opened up offices and showrooms at 1294 Granville St., Vancouver, B. C. Mr. Bishop was formerly manager of the Vancouver store of Bruce Robinson Electric, Ltd., former distributor of these products.

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HUGE POLE SHIPMENT GOES EAST—A solid train of 41 cars, each loaded with cedar poles, recently left Seattle bound for Minneapolis. The shipment was made by the Studebaker Pole Company to the National Coal & Trading Company, of Minneapolis. Five thousand poles from 25 to 50 ft. long made up the shipment, worth $40,000.

Arc Welding Prize Competition Announced

For the 41 best papers describing the advantages of arc welding in the redesign of any present product or in the design of any proposed product or structure, The Lincoln Electric Company, of Cleveland, Ohio, will award $17,500 in prizes in a second Lincoln arc welding prize competition, just announced. The 41 prizes are as follows:

For first prize paper	$7,500
For second prize paper	3,500
For third prize paper	1,500
For fourth prize paper	750
For fifth prize paper	500
For sixth prize paper	250
For 7th to 41st prize papers, each	100

The purpose of the competition, as announced by its sponsors, is to stimulate engineers and designers in every line of industry to think of the manufacture of their own products by the use of arc welding and to increase their knowledge of the feasibility of its application.

The jury of awards will be composed of the faculty members of the electrical engineering department of Ohio State University under the chairmanship of Prof. Erwin E. Dreese, head of the department, and such others as he may select.

The competition is open to any person in the world except employees of the sponsors. The closing date for the receipt of papers will be Oct. 1, 1931. Complete details of the rules governing the competition may be obtained from the Lincoln company.

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NEW COAST REPRESENTATIVE—The Hoskins Manufacturing Company, Detroit, manufacturers of resistance wire, electric furnaces and pyrometers, announce the appointment of E. A. Wilcox as their California representative, with offices at 273 Seventh St., San Francisco.

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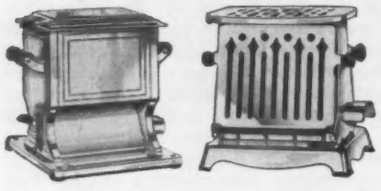
Oh, Cinderella!

When "Ted" Kennedy took over the management of Okonite's Los Angeles office recently the company promised him a new car to replace the one he'd worn to a frazzle in the San Francico territory. Here is Ted looking dubiously at the "new" Henry, not yet wise to the fact that the boys had pulled a fast one on him before the delivery of the promised automobile. The wreck was dubbed "Cinderella" owing to the loss of its right shoe

New Products

Two New Toasters

A chrominum plated automatic toaster known as the No. 205 L & H Electrics is being placed on the market by the A. J. Lindemann & Hoverson Company, of Milwaukee, Wis. The toaster takes two large slices of bread, which are inserted at the top and when done delivered below. Crumbs which drop down when the toast is delivered are caught and retained in the base. The covered top and ventilated sides of this toaster are conducive to the production of true oven toast, according to the manufacturer.



The No. 212 L & H Electrics Turnsit toaster, chrominum plated with nickel chromium heating element, has also been introduced recently by the Lindemann & Hoverson company. In this toaster the bread is reversed automatically each time the door is dropped. Its toasting surface is large enough to accommodate the larger slices of bread.—ELECTRICAL WEST, Nov. 1, 1930.

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"Armored" Heater Plug

A heater plug for general appliance use that has just been placed on the market by the Beaver Manufacturing Company, Newark, N. J., is completely armored to protect it from breaking if dropped on the floor or given other rough treatment. The usual black composition plug has been encased in a steel case, rust-proofed by the new cadmium process. Intended retail price, 25 cents.—ELECTRICAL WEST, Nov. 1, 1930.

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Inside-Frost Lamps Up to 500-Watt Size

The line of inside-frosted lamps sold under the Mazda trade name by the Edison Lamp Works and the National Lamp Works of the General Electric Company has been extended to include the 150, 200, 300, and 500-watt sizes. These lamps will find their greatest use in indirect and semi-indirect fixtures in stores, offices, and homes where it is desirable to have soft, pleasing and comfortable illumination. It is not intended that inside-frosted lamps will replace white bowl Mazda lamps as they are found desirable for use in open direct lighting reflectors such as those used in factories.—ELECTRICAL WEST, Nov. 1, 1930.

All-Round Tester

A handy testing device, known as the Detecto-Lite, recently brought out by the Eagle Electric Manufacturing Company, Inc., 57 Hall St., Brooklyn, N. Y., has a number of uses. It will test the voltage on any current from 110 to 550 volts and indicate whether a.c. or d.c., show the number of cycles, detect live and ground wires, and act as a pilot on any electrical apparatus. Retail price of regular model, $1.50; *de luxe* model with removable leads, $1.75.—ELECTRICAL WEST, Nov. 1, 1930.

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Low-Priced Refrigerator

A popular priced refrigerator is being manufactured by the newly formed Electrict Refrigeration Division of The Apex Electrical Manufacturing Company, Cleveland, Ohio. Two sizes are offered, one for household use and one for apartment house installation, and both are fnrnished in enamel on steel or porcelain on steel. A feature of the mechanism of the new refrigerators is the use of an all metal seal for the compressor shaft in place of the usual packing, which is claimed to prevent leakage and to account for the low price of $150 which has been established.—ELECTRICAL WEST, Nov. 1, 1930.

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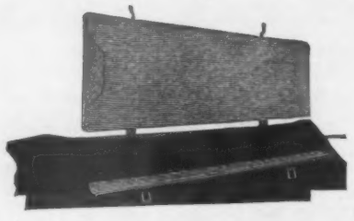
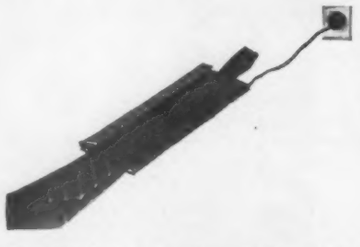
Electric Trouser Presser and Tie Press



The Jiffy electric trouser presser is said to combine the three essentials to speedy and perfect pressing, namely, heat, moisture and pressure. The trousers are placed in the presser as shown in the illustration, the top is brought down and clamped, it is then plugged into the light socket and the pressing begins. The length of time required depends upon the kind of cloth and the condition of the trousers; however, it should not take more than 30 minutes, the manufacturer claims. The outside finish is krinkle enamel in black or apple green. Nichrome wire is used in the heating pad.



The Jiffy tie press has double heating units and presses the wide and narrow ends and both sides of a tie and smooths out the lining all in one operation, requiring from 15 to 25 minutes. The tie press, when closed and wrapped in one thickness of soft cloth, can be made to serve as an emergency heating pad. Both trouser presser and tie press operate on 110 or 120 volts a. c. or d. c. List prices, east of the Mississippi, are $9.80 for the trouser presser and $3 for the tie press (slightly higher in the West). Manufactured by Wise-McClung Corporation, New Philadelphia, Ohio.—ELECTRICAL WEST, Nov. 1, 1930.

Ceiling Pull Switch

A ceiling pull switch with outlet box cover is being manufactured in one unit by the Arrow Electric Division of The Arrow-Hart & Hegeman Electric Company, Hartford, Conn. The switch cover is held by one center screw and the combination comes made up with a 3¼-in. or 4-in. cover.—ELECTRICAL WEST, Nov. 1, 1930.

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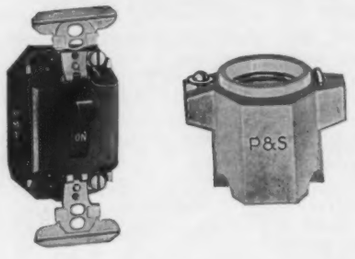
Switches, Sockets, and Receptacles

Additions to their line of switches, sockets and receptacles have been announced recently by Pass & Seymour, Inc., Solvay Station, Syracuse, N. Y. In a new group

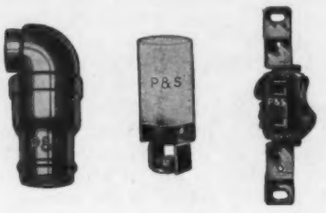


of enclosed flush tumbler switches (above left) with black Bakelite cups and brown or black indicating-type handles the black Bakelite covers are held in position by lugs in the composition at each end of the cup, the ears are so constructed that they fit into recesses at each end of the cover and are held firmly in place with one screw, and the yoke supporting the operating mechanism is entirely insulated and separate from the ears. Each switch is furnished with sufficient screws for mounting on boxes.

The Edison base one-piece sign receptacle (above right) has two bronze spring studs and clip terminals. A washer head spring stud snaps the device into place and a slight turn with a screw driver on the tee head spring stud causes it to snap into place, securely fastening the receptacle to the sign. According to the manufacturer, the lamp holder can be completely installed and wired from the rear of the sign.

An intermediate base brass shell angle socket (below left) has a⅛-in. cup. In the intermediate base keyless candle socket (below center) with detachable hickey and ⅛-in. nipple, the hickey is held to the socket body by means of one holding screw. Terminals are on the side of the socket body, and the diameter of the socket is 13/16 in. and the over-all length 2 1/32 in.

The single convenience outlet receptacle shown below at right can be installed in any standard switch box and used with any single gang toggle switch plate. The receptacle body is made of Bakelite and is rated at 10 amp., 250 volts, or 15 amp., 125 volts.—ELECTRICAL WEST, Nov. 1, 1930.



Electric Heater and Fan

Designed for year-round use, the Thermofan recently brought out by The American Foundry Equipment Company, Mishawaka, Ind., utilizes the principle of mechanical air circulation employed in the ordinary electric fan, forcing either hot or cool air to the spot where it is needed. The heating element of the Thermofan is cast integrally with an aluminum radiator from behind which a motor and fan disseminate warm air to the area to be heated, keeping all the air in constant circulation. The manufacturer states that the heater will raise the temperature in 1,000 cu. ft. of space at the rate of 1 deg. per minute. It is made for either 1,000 or 1,600 watts, from 110 to 115 volts a.c. or d.c Retail price, $39.50.—ELECTRICAL WEST, Nov. 1, 1930.

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Magnetic Clutches

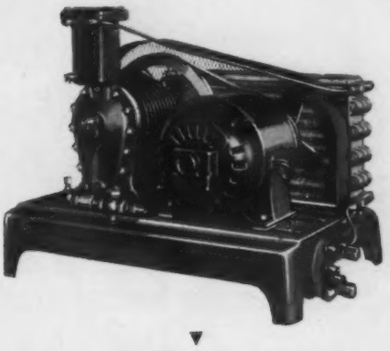
Better and more consistent operating characteristics, easier installation, greater safety, and easier access to parts which may have to be renewed, are claimed for a new line of magnetic clutches announced by Cutler-Hammer, Inc., 153 12th St., Milwaukee, Wis. In these clutches, known as the "Type L" because of the shape of the armature, the magnet coil is wound on a sheet metal form and vacuum impregnated before it is inserted in the field member. The coil is locked in place by means of four mounting studs which extend through the field casting. Loosening the four studs allows removal of the entire coil. All coil terminals are recessed below the surface of the field member to protect them against damage.

A centering bearing, which is a roller bearing mounted in the field member and which protrudes so that it fits into a recess in the armature hub, forms a common support for both clutch members, yet allows either member to revolve independently of the other, when disengaged.

The collector rings are made of brass to prevent corrosion and are mounted away from the hub, on four insulated studs, so that it is practically impossible for sufficient dust to collect to cause creepage between the rings. Two carbon brushes are used on each collector ring. A lining wear indicator shows the operator when the lining has worn to a point where it must be readjusted.—ELECTRICAL WEST, Nov, 1, 1930.

Refrigerator Compressor

In the mechanical refrigeration equipment being manufactured by the Potter Refrigeration Corporation, Ninth and Flanders Sts., Portland, Ore., the lubricating oil is kept within the compressor and is not carried through the system by the refrigerant, and the change of refrigerant from liquid to gas and back to liquid is accomplished with an unusually simple mechanism. The three moving parts of the compressor are totally submerged in oil at all times. No valves, piston rings, piston pins nor seal springs are used in the compressor, which is built in one and two-cylinder, oscillating reciprocating types, covering a range of nine models.—ELECTRICAL WEST, Nov. 1, 1930.



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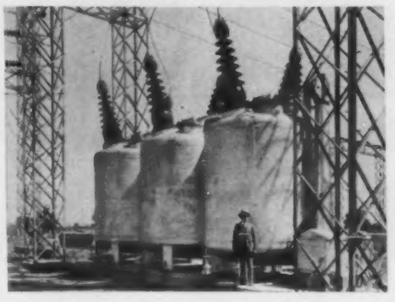
Oil Circuit Breakers

Floor mounted oil circuit breakers equipped with roller bearings on the control shaft and having interrupting capacities up to 2,500,000 kva. are being manufactured by the Pacific Electric Manufacturing Corporation for use on transmission systems operating at voltages of from 69 kv. to 230 kv. The circuit is interrupted by six breaks in series per phase.

Heavy boiler-plate steel is used for the construction of the tanks, which are reenforced by longitudinal ribs welded to the inside of the top, both top and bottom of the tank being a one-piece bumped sheet. All ports, flanges, and supports are electrically welded to the tanks, leaving them free from bolts or rivets.—ELECTRICAL WEST, Nov. 1, 1930.



Trade Literature

¶ AUTOMATIC CONTROLS—Indicating, recording and controlling pyrometers for measuring temperatures to 3,000 deg. F., manufactured by The Brown Instrument Company, Philadelphia, Pa., are fully described in Catalog No. 15A recently issued by that company. "The Era of Automatic Control" is another recent illustrated booklet of this company which describes the installation of Brown automatic controls in various industrial plants.

¶ BASEBALL FIELD AND GOLF COURSE LIGHTING—The lighting of baseball fields, golf driving ranges and miniature golf courses is gone into in detail in two recent lighting data bulletins of the Crouse-Hinds Company, Syracuse, N. Y., numbered 2,225 and 2,224 respectively.

¶ G. E. PUBLICATIONS—Recent publications issued by the General Electric Company, Schenectady, N. Y., include the following:

GEA-546A: Carrier-Current Telephony.
GEA-1210: Electric Equipment for Cranes.
GEA-969D: Primary Cutouts.
GEA-1172A: G-E Super Synchronous Motors.
GEA-1152A: G-E Synchronous Motors for Pumping.
GEA-1089A: Automatic Telemetering Equipment.
GEA-1317: Surge Indicator.
GEA-161F: Novalux Floodlighting Projectors.
GEA-532D: G-E Electric Heating Equipment for Stereotype-Metal Furnaces.
GEA-1303A: General - Purpose Squirrel Cage Induction Motors.
GEA-1277: G-E Fractional Horsepower Motors and Motor Parts.
GEA-1318: The G-E Quartz-Rod Thermostat.
GEA-39B: D.C. Crane and Hoist Motors.

¶ LIGHTING EQUIPMENT CATALOG—Beverly Catalog No. 45 in loose-leaf form has just been issued by the Beverly Division of the Beardslee Chandelier Manufacturing Company, 218 South Jefferson St., Chicago. The catalog presents an extensive showing of standard types as well as individual designs and novelties in lighting fixtures.

¶ SYNCHRONOUS MOTORS—In its Bulletin No. 1,150, the Allis-Chalmers Manufacturing Company, Milwaukee, Wis., illustrates and describes Hytork synchronous motors for cement mills, flour mills, and applications requiring high starting torque with minimum current from the line.

¶ REPULSION INDUCTION MOTORS — The Master Electric Company, Dayton, Ohio, has issued Section 202 for addition to its data book on single-phase motors. This section is devoted to a.c. repulsion induction motors, type RA, 1/30 to 5 hp.

¶ DOOR CHIMES—Various installations of Velvatone door chimes are suggested in a recent booklet of the Electric Signal Company, Ltd., Los Angeles. Prices of standard sets of chimes are given.

¶ PORCELAIN LIGHTING UNITS—Catalog No. 30 consisting of 46 pages is being distributed by Pass & Seymour, Inc., Solvay Station, Syracuse, N. Y. The catalog gives complete information on the company's line of electrical wiring devices and porcelain lighting units.

¶ SOLDERLESS CONNECTORS AND ANCHORS —Recent catalog additions issued by the W. N. Matthews Corporation, St. Louis, Mo., contain information and announcement of price reductions on the company's solderless service connectors and "Scrulix" anchors and installing tools.

¶ ELECTRICAL AND RADIO SPECIALTIES—A new catalog featuring more than 200 electrical and radio specialties is being distributed by the Eagle Electric Manufacturing Company, 59 Hall St., Brooklyn, N. Y.

¶ CONTROL APPARATUS—A new line of air operated control equipment applicable to a number of industrial requirements is described in Catalog No. 4,000 recently issued by The Bristol Company, Waterbury, Conn.

¶ TENSION INDICATOR—A shunt type tension indicator for determining the tension on a wire line is fully described in a recent bulletin of the Martin-Decker Corporation, 3431 Cherry Ave., Long Beach, Calif.

¶ MANGANESE STEEL FEEDER—Stephens-Adamson Manufacturing Company, Los Angeles, has published a folder describing a manganese steel feeder designed primarily to handle abrasive bulk materials in large tonnages. Tables of capacities, dimensions, and building clearances are given.

¶ WORK-CYCLE TIMER—A description of the construction and method of operation of the work-cycle timer manufactured by the Monitor Controller Company, Baltimore, Md., is given in a recent catalog addition issued by that company.

Barometer

INDUSTRIAL activity in the West is, on the whole, much nearer the 1929 level than in the country at large. The regional index based on reports of electrical energy consumption by manufacturing establishments rose 6.4 per cent in September compared with August, bringing it 3.2 per cent above the July figure and within 1.6 per cent of that of June, the maximum thus far in 1930.

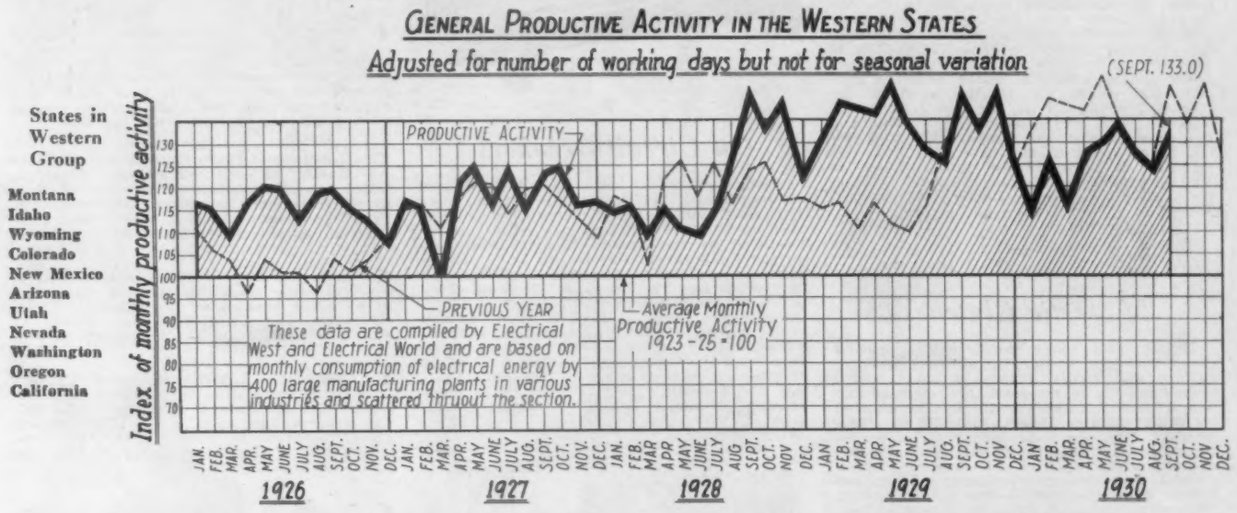
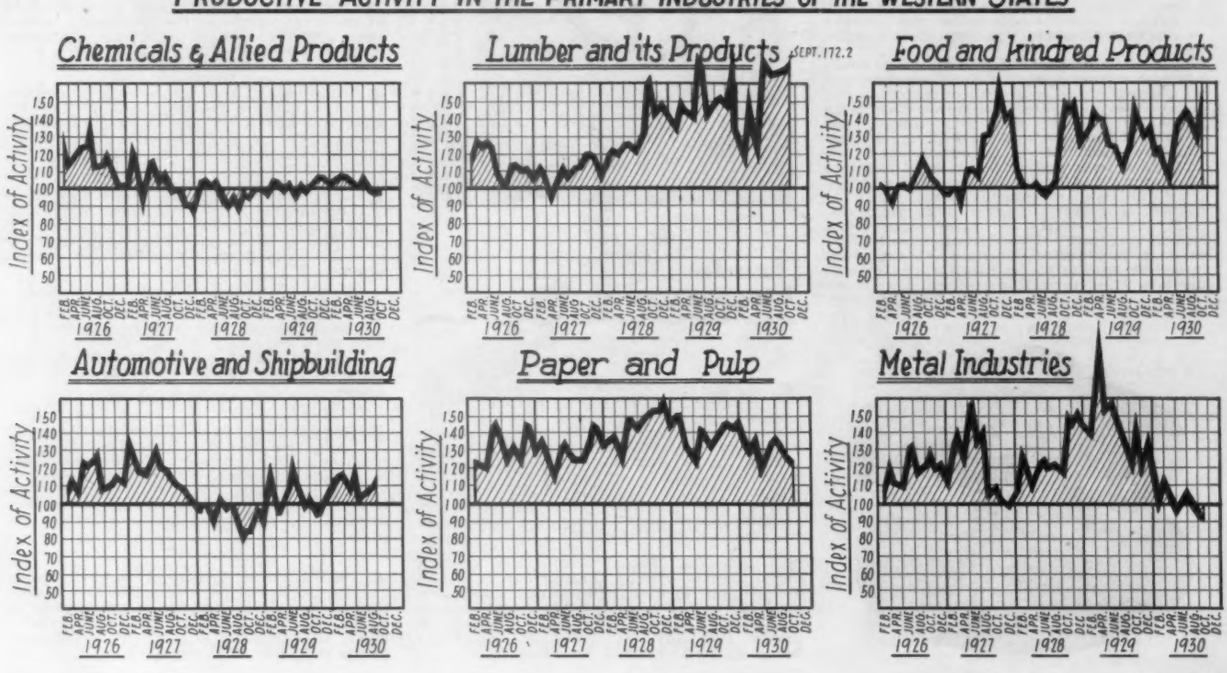
Comparing the current year with the preceding, the September index is down 7 per cent, the nine-month index 6.2 per cent. The comparison may be misleading unless it is also stated that September was the second highest month in 1929.

Meanwhile the country-wide index rose only 5 per cent from August and remains 18.5 per cent below that of last year's September.

Definite gains were indicated in the food, forest products and chemical industries. The first named rose 16 per cent compared with August, and stood 2.3 per cent higher than in September 1929; the second gained 2.4 per cent with a year's net gain of 12 per cent; in chemicals the advance was 0.4 per cent and the year's change a decline of 2.2 per cent.

Three other industries decreased, but not sufficiently to outweigh the gains in the important industries previously mentioned. Metal-working, already low, suffered a further slight decline and is 40 per cent lower than a year ago; rubber products fell nearly 10 per cent; paper and pulp, falling irregularly, also reached the year's low.

Indexes of Industrial Activity in the Western States

(All figures adjusted for number of working days)

	Sept. 1930	Aug. 1930	Sept. 1929	Average First 9 Months 1930	Average First 9 Months 1929
All industry	133.0	125.0	143.1	126.7	135.1
Chemical and allied products	97.1	96.7	99.3	103.6	97.8
Food and kindred products	156.5	135.0	153.0	134.2	133.7
Forest products	172.2	168.2	153.6	158.5	153.9
Metals group	90.3	91.1	151.4	99.9	152.6
Paper and pulp	122.7	129.2	146.4	131.5	141.8
Rubber and its products	127.0	140.5	147.7	159.5	186.1
Shipbuilding	.....	115.1	91.3	.....	.....
Stone, clay and glass	.....	103.3	157.0	.....	.....